Computer algebra independent integration tests

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

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Contents

Chapter 1

Introduction

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

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

1.1 Listing of CAS systems tested

The following systems were tested at this time.

1. Mathematica 12.1 (64 bit) on windows 10.
2. Rubi 4.16.1 in Mathematica 12 on windows 10.
3. Maple 2020 (64 bit) on windows 10.
4. Maxima 5.43 on Linux. (via sagemath 8.9)
5. Fricas 1.3.6 on Linux (via sagemath 9.0)
6. Sympy 1.5 under Python 3.7.3 using Anaconda distribution.
7. Giac/Xcas 1.5 on Linux. (via sagemath 8.9)

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

Sympy was called directly using Python.

1.2 Results

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

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

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

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

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

System	solved	Failed
Rubi	% 99.57 (700)	% 0.43 (3)
Mathematica	% 98.72 (694)	% 1.28 (9)
Maple	% 78.81 (554)	% 21.19 (149)
Maxima	% 27.03 (190)	% 72.97 (513)
Fricas	% 37.7 (265)	% 62.3 (438)
Sympy	% 24.47 (172)	% 75.53 (531)
Giac	% 39.83 (280)	% 60.17 (423)

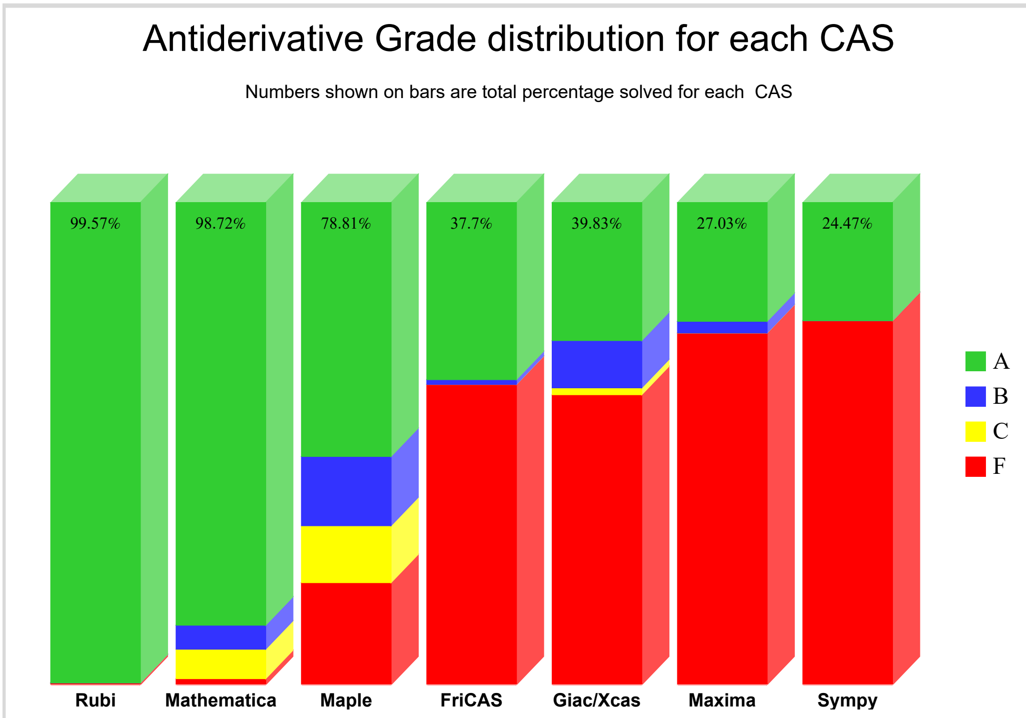
The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives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

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

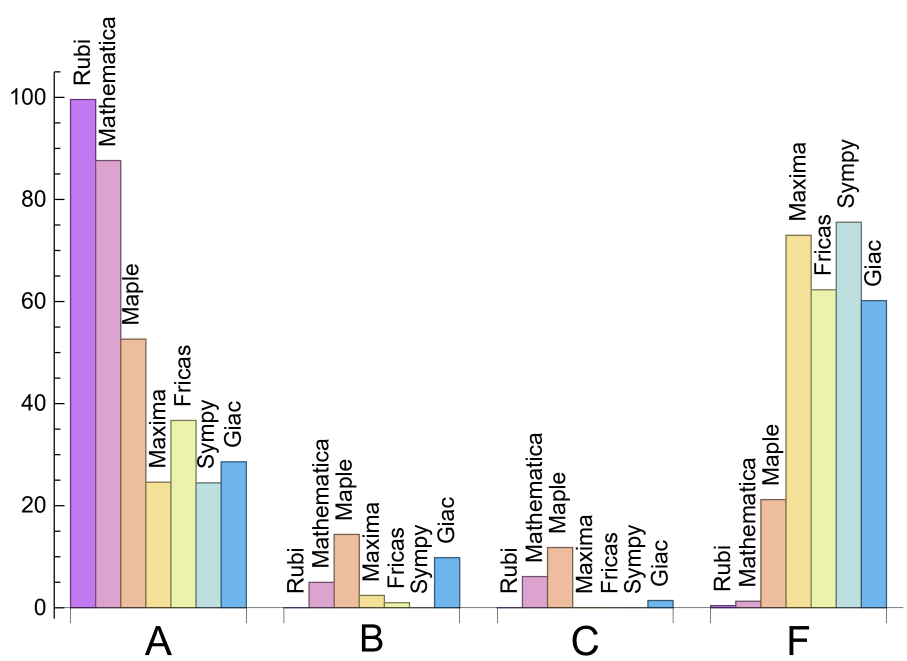
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	99.57	0.	0.	0.43
Mathematica	87.62	4.98	6.12	1.28
Maple	52.63	14.37	11.81	21.19
Maxima	24.61	2.42	0.	72.97
Fricas	36.7	1.	0.	62.3
Sympy	24.47	0.	0.	75.53
Giac	28.59	9.82	1.42	60.17

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



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



1.3 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.38	224.5	0.81	188.5	1.
Mathematica	2.73	240.44	0.86	165.	0.82
Maple	0.39	511.94	1.84	248.	1.35
Maxima	0.87	158.59	0.92	15.	0.34
Fricas	1.33	313.62	1.83	119.	1.71
Sympy	8.04	128.59	0.69	0.	0.
Giac	1.9	444.98	2.49	39.5	1.18

1.4 list of integrals that has no closed form antiderivative

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

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 54, 65, 67, 81, 82, 83, 96, 97, 98, 106, 108, 115, 117, 136, 138, 161, 162, 163, 164, 170, 171, 172, 173, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 200, 201, 203, 205, 206, 207, 208, 209, 214, 215, 216, 217, 222, 223, 224, 225, 230, 231, 232, 233, 240, 241, 242, 243, 245, 246, 247, 249, 251, 252, 253, 254, 255, 257, 258, 259, 260, 261, 262, 263, 269, 271, 294, 308, 309, 310, 328, 431, 432, 433, 434, 436, 437, 438, 439, 442, 443, 447, 448, 451, 452, 455, 456, 460, 461, 464, 465, 466, 467, 471, 472, 477, 478, 515, 529, 534, 535, 545, 551, 557, 562, 563, 566, 567, 569, 570, 571, 572, 573, 574, 575, 579, 580, 584, 585, 589, 590, 595, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 637, 638, 639, 640, 641, 646, 647, 648, 651, 652, 653, 663, 686, 687, 688, 691, 692, 695, 696, 697, 700, 701}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

The percentage of such failures were not counted for each test file, but for an example, for the Timofeev test file, there were about 30 such integrals out of total 705, or about 4 percent. This pecrentage can be higher or lower depending on the specific input test file.

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. If the output was an exception `ValueError` then this is most likely due to this reason.

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

The other CAS systems (SageMath and Sympy) do not have special buildin function for this purpose at this time. Therefore the leaf size is determined as follows.

For Fricas, Giac and Maxima (all called via sagemath) the following code is used

```
#see https://stackoverflow.com/questions/25202346/how-to-obtain-leaf-count-expression-size-in-s

def tree(expr):
    if expr.operator() is None:
       return expr
    else:
       return [expr.operator()]+map(tree, expr.operands())

try:
    # 1.35 is a fudge factor since this estimate of leaf count is bit lower than
    #what it should be compared to Mathematica's
    leafCount = round(1.35*len(flatten(tree(anti))))
except Exception as ee:
    leafCount =1
```

For Sympy, called directly from Python, the following code is used

```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
```

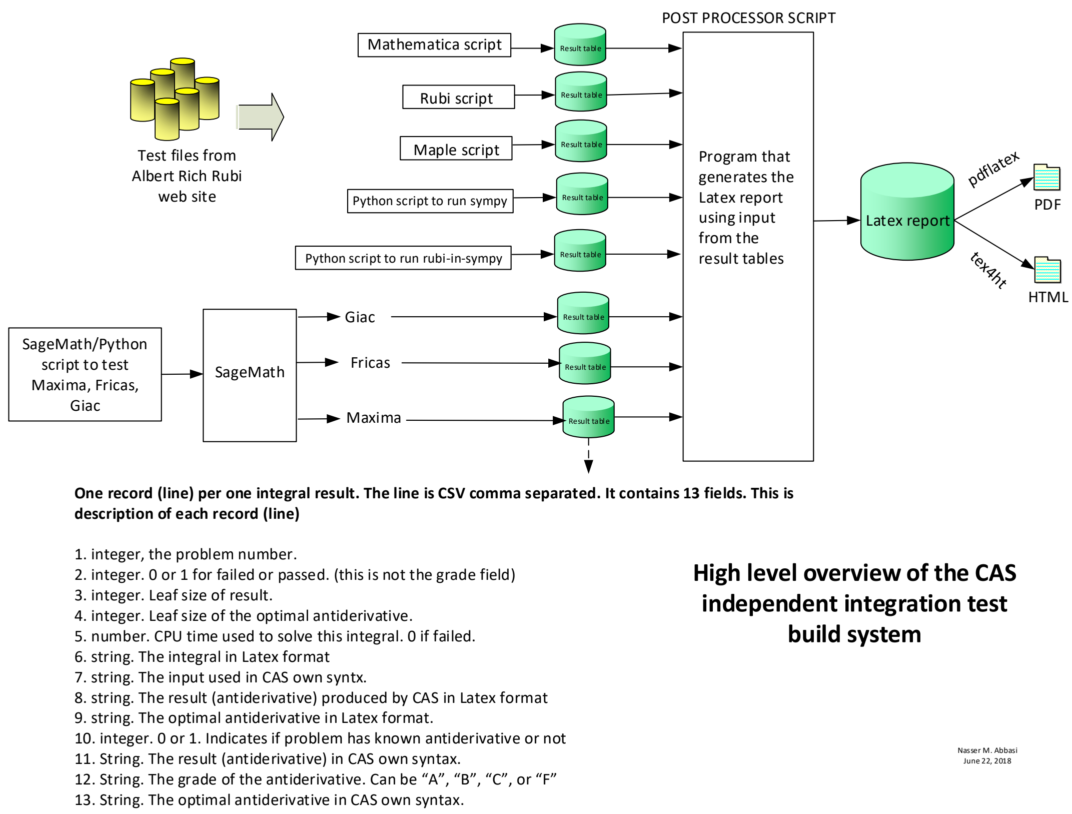
```
leafCount = round(1.7*count_ops(anti))

except Exception as ee:
       leafCount =1
```

When these cas systems have a buildin function to find the leaf size of expressions, it will be used instead, and these tests run again.

1.10 Design of the test system

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



Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

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

B grade: { }

C grade: { }

F grade: { 276, 277, 278}

2.1.2 Mathematica

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

B grade: { 29, 31, 32, 34, 36, 38, 39, 41, 46, 48, 50, 52, 184, 191, 192, 193, 198, 200, 207, 209, 294, 521, 529, 534, 551, 556, 557, 561, 564, 568, 570, 571, 588, 591, 593 }

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

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

2.1.3 Maple

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 48, 50, 52, 54, 65, 67, 81, 84, 96, 97, 98, 99, 100, 101, 102, 103, 105, 106, 107, 108, 114, 115, 125, 127, 136, 138, 146, 147, 148, 156, 157, 158, 159, 160, 162, 164, 165, 166, 167, 168, 169, 171, 173, 174, 175, 176, 177, 178, 180, 182, 184, 186, 189, 191, 240, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 293, 294, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 444, 445, 446, 449, 450, 453, 454, 457, 458, 459, 462, 463, 464, 468, 469, 470, 474, 475, 476, 479, 480, 481, 485, 486, 490, 491, 495, 496, 497, 501, 502, 503, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 649, 650, 657, 658, 661, 662, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703 }

B grade: { 32, 33, 35, 42, 47, 49, 51, 53, 55, 56, 57, 66, 68, 69, 70, 82, 83, 85, 86, 104, 110, 112, 117, 161, 163, 170, 172, 179, 181, 187, 188, 190, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 211, 213, 214, 215, 216, 217, 219, 221, 222, 223, 224, 225, 227, 229, 230, 231, 232, 233, 235, 237, 239, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 634, 642, 643, 659, 660, 691, 692 }

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

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

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 7, 9, 12, 14, 16, 18, 23, 25, 27, 64, 80, 95, 99, 101, 102, 103, 104, 105, 107, 113, 124, 132, 133, 135, 140, 146, 147, 148, 156, 158, 212, 220, 228, 238, 265, 267, 268, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 299, 300, 302, 304, 306, 307, 314, 315, 321, 322, 323, 324, 329, 330, 331, 332, 337, 338, 339, 340, 346, 347, 348, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 385, 386, 387, 388, 394, 395, 396, 397, 404, 405, 406, 407, 413, 414, 415, 422, 425, 429, 430, 435, 440, 458, 459, 463, 485, 486, 490, 491, 495, 496, 532, 539, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 657, 658, 659, 660, 661, 662, 667, 671, 672, 673, 674, 675, 676, 690, 694, 699, 702, 703

B grade: { 10, 11, 13, 19, 20, 21, 22, 40, 160, 165, 167, 169, 174, 176, 178, 195, 379 }

C grade: { }

F grade: { 6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 96, 97, 98, 100, 106, 108, 109, 110, 111, 112, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 125, 126, 127, 128, 129, 130, 131, 134, 136, 137, 138, 139, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 157, 159, 161, 162, 163, 164, 166, 168, 170, 171, 172, 173, 175, 177, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 213, 214, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 226, 227, 229, 230, 231, 232, 233, 234, 235, 236, 237, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 266, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 295, 296, 297, 298, 301, 303, 305, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 349, 350, 351, 352, 353, 374, 375, 376, 377, 378, 380, 381, 382, 383, 384, 389, 390, 391, 392, 393, 398, 399, 400, 401, 402, 403, 408, 409, 410, 411, 412, 416, 417, 418, 419, 420, 421, 423, 424, 426, 427, 428, 431, 432, 433, 434, 436, 437, 438, 439, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 460, 461, 462, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 487, 488, 489, 492, 493, 494, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 533, 534, 535, 536, 537, 538, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 663, 664, 665, 666, 668, 669, 670, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 691, 692, 693, 695, 696, 697, 698, 700, 701 }

2.1.5 FriCAS

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

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

C grade: { }

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

2.1.6 Sympy

A grade: { 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 25, 27, 99, 101, 102, 103, 104, 105, 146, 147, 156, 157, 158, 159, 160, 165, 166, 167, 168, 169, 174, 175, 176, 177, 178, 264, 265, 266, 267, 268, 279, 280, 285, 286, 288, 289, 290, 291, 302, 303, 304, 305, 306, 307, 314, 315, 321, 322, 323, 324, 329, 330, 331, 332, 346, 347, 348, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 368, 369, 370, 371, 373, 377, 378, 380, 385, 386, 387, 388, 394, 395, 396, 407, 414, 415, 417, 418, 419, 420, 421, 424, 425, 426, 427, 430, 435, 440, 445, 458, 469, 485, 486, 497, 501, 502, 503, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 649, 650, 657, 659, 660, 661, 662, 664, 665, 666, 671, 673, 674, 675, 676, 682, 683, 684, 689, 690, 693, 698, 702 }

B grade: { }

C grade: { }

F grade: { 6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 148, 149, 150, 151, 152, 153, 154, 155, 161, 162, 163, 164, 170, 171, 172, 173, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 281, 282, 283, 284, 287, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 349, 350, 351, 352, 353, 354, 367, 372, 374, 375, 376, 379, 381, 382, 383, 384, 389, 390, 391, 392, 393, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 408, 409, 410, 411, 412, 413, 416, 422, 423, 428, 429, 431, 432, 433, 434, 436, 437, 438, 439, 441, 442, 443, 444, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 498, 499, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 651, 652, 653, 654, 655, 656, 658, 663, 667, 668, 669, 670, 672, 677, 678, 679, 680, 681, 685, 686, 687, 688, 691, 692, 694, 695, 696, 697, 699, 700, 701, 703 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 40, 47, 99, 101, 102, 103, 104, 105, 140, 146, 147, 148, 156, 158, 159, 160, 166, 168, 169, 175, 177, 264, 265, 266, 267, 268, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 302, 303, 304, 305, 306, 307, 311, 312, 313, 314, 315, 319, 320, 321, 322, 323, 324, 328, 329, 330, 331, 332, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 350, 351, 352, 353, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 380, 385, 386, 387, 388, 389, 394, 395, 396, 397, 398, 403, 404, 405, 406, 407, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 425, 427, 430, 435, 440, 445, 446, 450, 454, 457, 458, 459, 462, 463, 469, 470, 475, 476, 480, 481, 485, 486, 490, 491, 495, 496, 501, 502, 503, 599, 600, 609, 649, 650, 657, 658, 662, 664, 665, 666, 667, 668, 669, 670, 671, 673, 674, 675, 676, 680, 682, 683, 684, 685, 689, 693, 698, 702 }

B grade: { 7, 9, 16, 25, 49, 107, 157, 165, 167, 174, 176, 178, 195, 202, 204, 316, 317, 318, 325, 326, 327, 333, 334, 335, 336, 349, 381, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 408, 409, 410, 411, 412, 577, 582, 596, 597, 598, 602, 604, 605, 606, 607, 608, 611, 613, 614, 615, 616, 617, 618, 620, 623, 659, 660, 661, 677, 678, 679 }

C grade: { 354, 464, 686, 687, 688, 691, 692, 695, 696, 697 }

F grade: { 6, 8, 15, 17, 18, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 106, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 161, 162, 163, 164, 170, 171, 172, 173, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 200, 201, 203, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 308, 309, 310, 379, 424, 426, 428, 429, 431, 432, 433, 434, 436, 437, 438, 439, 441, 442, 443, 444, 447, 448, 449, 451, 452, 453, 455, 456, 460, 461, 465, 466, 467, 468, 471, 472, 473, 474, 477, 478, 479, 482, 483, 484, 487, 488, 489, 492, 493, 494, 497, 498, 499, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 578, 579, 580, 581, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 622, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 651, 652, 653, 654, 655, 656, 663, 672, 681, 690, 694, 699, 700, 701, 703 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	87	130	255	244	151	263
normalized size	1	1.	0.68	1.02	1.99	1.91	1.18	2.05
time (sec)	N/A	0.12	0.136	0.008	1.621	2.14	12.675	1.427

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	89	118	261	221	138	220
normalized size	1	1.	0.72	0.96	2.12	1.8	1.12	1.79
time (sec)	N/A	0.096	0.09	0.008	1.529	2.041	13.766	1.375

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	85	110	200	213	126	192
normalized size	1	1.	0.81	1.05	1.9	2.03	1.2	1.83
time (sec)	N/A	0.103	0.096	0.006	1.522	2.148	3.554	1.35

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	90	77	98	205	200	117	124
normalized size	1	1.	0.86	1.09	2.28	2.22	1.3	1.38
time (sec)	N/A	0.042	0.086	0.004	1.583	2.171	7.073	1.353

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	88	82	131	163	90	108
normalized size	1	1.	1.14	1.06	1.7	2.12	1.17	1.4
time (sec)	N/A	0.061	0.069	0.006	1.688	2.166	3.523	1.325

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	121	121	99	178	0	0	0	0
normalized size	1	1.	0.82	1.47	0.	0.	0.	0.
time (sec)	N/A	0.116	0.119	0.158	0.	0.	0.	0.

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	78	67	111	236	82	1156
normalized size	1	1.	1.13	0.97	1.61	3.42	1.19	16.75
time (sec)	N/A	0.076	0.036	0.007	1.566	2.566	5.354	6.151

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	139	139	110	195	0	0	0	0
normalized size	1	1.	0.79	1.4	0.	0.	0.	0.
time (sec)	N/A	0.121	0.105	0.23	0.	0.	0.	0.

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	93	91	166	259	178	400
normalized size	1	1.	1.15	1.12	2.05	3.2	2.2	4.94
time (sec)	N/A	0.086	0.04	0.011	1.607	2.958	7.588	22.481

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	119	172	443	366	230	383
normalized size	1	1.	0.64	0.92	2.38	1.97	1.24	2.06
time (sec)	N/A	0.207	0.107	0.01	1.576	2.567	34.093	1.304

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	184	184	115	160	451	351	218	286
normalized size	1	1.	0.62	0.87	2.45	1.91	1.18	1.55
time (sec)	N/A	0.17	0.1	0.007	1.584	2.537	20.734	1.274

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	111	152	360	329	202	306
normalized size	1	1.	0.69	0.94	2.24	2.04	1.25	1.9
time (sec)	N/A	0.17	0.092	0.006	1.587	2.554	14.912	1.305

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	94	140	369	306	190	182
normalized size	1	1.	0.76	1.13	2.98	2.47	1.53	1.47
time (sec)	N/A	0.065	0.064	0.006	1.691	2.155	7.703	1.274

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	95	122	265	274	165	213
normalized size	1	1.	0.73	0.93	2.02	2.09	1.26	1.63
time (sec)	N/A	0.104	0.092	0.004	1.71	2.092	4.835	1.212

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	184	184	142	250	0	0	0	0
normalized size	1	1.	0.77	1.36	0.	0.	0.	0.
time (sec)	N/A	0.202	0.161	0.219	0.	0.	0.	0.

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	126	117	216	343	182	3668
normalized size	1	1.	1.02	0.95	1.76	2.79	1.48	29.82
time (sec)	N/A	0.155	0.09	0.007	1.562	2.464	10.357	31.369

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	201	201	162	278	0	0	0	0
normalized size	1	1.	0.81	1.38	0.	0.	0.	0.
time (sec)	N/A	0.208	0.167	0.375	0.	0.	0.	0.

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	136	115	230	358	235	0
normalized size	1	1.	1.06	0.9	1.8	2.8	1.84	0.
time (sec)	N/A	0.162	0.093	0.01	1.585	2.529	12.142	0.

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	232	232	143	214	647	489	289	477
normalized size	1	1.	0.62	0.92	2.79	2.11	1.25	2.06
time (sec)	N/A	0.291	0.189	0.016	1.579	2.218	91.578	1.289

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	139	202	657	454	280	331
normalized size	1	1.	0.67	0.98	3.19	2.2	1.36	1.61
time (sec)	N/A	0.179	0.189	0.013	1.649	2.085	69.103	1.267

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	207	207	135	194	537	428	265	400
normalized size	1	1.	0.65	0.94	2.59	2.07	1.28	1.93
time (sec)	N/A	0.258	0.162	0.006	1.641	2.263	26.984	1.203

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	110	182	548	404	253	227
normalized size	1	1.	0.73	1.21	3.65	2.69	1.69	1.51
time (sec)	N/A	0.076	0.081	0.004	1.771	2.122	17.473	1.25

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	119	164	414	367	221	302
normalized size	1	1.	0.68	0.94	2.37	2.1	1.26	1.73
time (sec)	N/A	0.171	0.205	0.004	1.636	2.199	20.578	1.235

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	235	235	183	302	0	0	0	0
normalized size	1	1.	0.78	1.29	0.	0.	0.	0.
time (sec)	N/A	0.283	0.21	0.275	0.	0.	0.	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	166	155	338	427	287	7443
normalized size	1	1.	1.01	0.95	2.06	2.6	1.75	45.38
time (sec)	N/A	0.231	0.112	0.006	1.6	2.815	40.478	145.438

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	263	263	203	330	0	0	0	0
normalized size	1	1.	0.77	1.25	0.	0.	0.	0.
time (sec)	N/A	0.298	0.178	0.473	0.	0.	0.	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	175	161	327	440	326	0
normalized size	1	1.	0.98	0.9	1.84	2.47	1.83	0.
time (sec)	N/A	0.251	0.153	0.01	1.568	2.804	17.558	0.

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	172	172	286	270	0	0	0	0
normalized size	1	1.	1.66	1.57	0.	0.	0.	0.
time (sec)	N/A	0.238	0.305	0.253	0.	0.	0.	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	144	144	294	181	0	0	0	0
normalized size	1	1.	2.04	1.26	0.	0.	0.	0.
time (sec)	N/A	0.188	0.125	0.148	0.	0.	0.	0.

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	124	124	238	218	0	0	0	0
normalized size	1	1.	1.92	1.76	0.	0.	0.	0.
time (sec)	N/A	0.137	0.102	0.096	0.	0.	0.	0.

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	82	82	244	118	0	0	0	0
normalized size	1	1.	2.98	1.44	0.	0.	0.	0.
time (sec)	N/A	0.105	0.076	0.042	0.	0.	0.	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	84	84	207	426	0	0	0	0
normalized size	1	1.	2.46	5.07	0.	0.	0.	0.
time (sec)	N/A	0.067	0.23	0.102	0.	0.	0.	0.

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	71	71	105	215	0	0	0	0
normalized size	1	1.	1.48	3.03	0.	0.	0.	0.
time (sec)	N/A	0.11	0.076	0.073	0.	0.	0.	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	116	116	259	236	0	0	0	0
normalized size	1	1.	2.23	2.03	0.	0.	0.	0.
time (sec)	N/A	0.151	0.344	0.133	0.	0.	0.	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	124	124	149	296	0	0	0	0
normalized size	1	1.	1.2	2.39	0.	0.	0.	0.
time (sec)	N/A	0.187	0.334	0.171	0.	0.	0.	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	173	173	350	303	0	0	0	0
normalized size	1	1.	2.02	1.75	0.	0.	0.	0.
time (sec)	N/A	0.244	0.147	0.177	0.	0.	0.	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	187	187	332	305	0	0	0	0
normalized size	1	1.	1.78	1.63	0.	0.	0.	0.
time (sec)	N/A	0.237	0.453	0.267	0.	0.	0.	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	155	155	334	251	0	0	0	0
normalized size	1	1.	2.15	1.62	0.	0.	0.	0.
time (sec)	N/A	0.184	0.52	0.263	0.	0.	0.	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	144	144	463	263	0	0	0	0
normalized size	1	1.	3.22	1.83	0.	0.	0.	0.
time (sec)	N/A	0.136	0.173	0.171	0.	0.	0.	0.

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	50	98	225	115	0	120
normalized size	1	1.	0.88	1.72	3.95	2.02	0.	2.11
time (sec)	N/A	0.048	0.047	0.011	1.742	2.042	0.	1.409

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	141	141	334	260	0	0	0	0
normalized size	1	1.	2.37	1.84	0.	0.	0.	0.
time (sec)	N/A	0.096	0.808	0.087	0.	0.	0.	0.

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	122	122	153	335	0	0	0	0
normalized size	1	1.	1.25	2.75	0.	0.	0.	0.
time (sec)	N/A	0.173	0.357	0.169	0.	0.	0.	0.

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	186	186	348	330	0	0	0	0
normalized size	1	1.	1.87	1.77	0.	0.	0.	0.
time (sec)	N/A	0.193	0.798	0.193	0.	0.	0.	0.

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	159	159	213	367	0	0	0	0
normalized size	1	1.	1.34	2.31	0.	0.	0.	0.
time (sec)	N/A	0.264	0.722	0.184	0.	0.	0.	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	259	285	426	426	0	0	0	0
normalized size	1	1.1	1.64	1.64	0.	0.	0.	0.
time (sec)	N/A	0.308	0.929	0.23	0.	0.	0.	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	204	204	445	389	0	0	0	0
normalized size	1	1.	2.18	1.91	0.	0.	0.	0.
time (sec)	N/A	0.241	1.071	0.378	0.	0.	0.	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	79	212	0	188	0	167
normalized size	1	1.	0.79	2.12	0.	1.88	0.	1.67
time (sec)	N/A	0.084	0.073	0.02	0.	2.097	0.	1.368

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	202	202	445	386	0	0	0	0
normalized size	1	1.	2.2	1.91	0.	0.	0.	0.
time (sec)	N/A	0.184	0.707	0.3	0.	0.	0.	0.

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	62	151	0	186	0	232
normalized size	1	1.	0.75	1.82	0.	2.24	0.	2.8
time (sec)	N/A	0.054	0.101	0.01	0.	2.27	0.	1.325

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	196	196	501	384	0	0	0	0
normalized size	1	1.	2.56	1.96	0.	0.	0.	0.
time (sec)	N/A	0.134	1.544	0.145	0.	0.	0.	0.

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	173	173	201	503	0	0	0	0
normalized size	1	1.	1.16	2.91	0.	0.	0.	0.
time (sec)	N/A	0.252	0.936	0.199	0.	0.	0.	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	242	242	512	461	0	0	0	0
normalized size	1	1.	2.12	1.9	0.	0.	0.	0.
time (sec)	N/A	0.242	1.512	0.223	0.	0.	0.	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	248	248	256	635	0	0	0	0
normalized size	1	1.	1.03	2.56	0.	0.	0.	0.
time (sec)	N/A	0.346	1.479	0.264	0.	0.	0.	0.

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	317	369	587	576	0	0	0	0
normalized size	1	1.16	1.85	1.82	0.	0.	0.	0.
time (sec)	N/A	0.382	1.52	0.304	0.	0.	0.	0.

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	262	262	169	482	0	0	0	0
normalized size	1	1.	0.65	1.84	0.	0.	0.	0.
time (sec)	N/A	0.282	0.124	0.448	0.	0.	0.	0.

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	140	373	0	0	0	0
normalized size	1	1.	0.74	1.97	0.	0.	0.	0.
time (sec)	N/A	0.191	0.096	0.206	0.	0.	0.	0.

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	111	260	0	0	0	0
normalized size	1	1.	0.96	2.24	0.	0.	0.	0.
time (sec)	N/A	0.055	0.05	0.112	0.	0.	0.	0.

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	142	308	0	0	0	0
normalized size	1	1.	1.29	2.8	0.	0.	0.	0.
time (sec)	N/A	0.11	0.328	0.172	0.	0.	0.	0.

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	134	1117	0	883	0	0
normalized size	1	1.	1.21	10.06	0.	7.95	0.	0.
time (sec)	N/A	0.093	0.133	0.243	0.	2.6	0.	0.

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	162	1902	0	1056	0	0
normalized size	1	1.	0.87	10.17	0.	5.65	0.	0.
time (sec)	N/A	0.134	0.138	0.302	0.	2.713	0.	0.

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	263	187	2748	0	1218	0	0
normalized size	1	1.	0.71	10.45	0.	4.63	0.	0.
time (sec)	N/A	0.169	0.159	0.361	0.	3.317	0.	0.

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	256	256	157	953	0	393	0	0
normalized size	1	1.	0.61	3.72	0.	1.54	0.	0.
time (sec)	N/A	0.208	0.164	0.4	0.	2.441	0.	0.

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	134	617	0	319	0	0
normalized size	1	1.	0.73	3.37	0.	1.74	0.	0.
time (sec)	N/A	0.168	0.085	0.277	0.	2.444	0.	0.

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	70	343	101	248	0	0
normalized size	1	1.	0.64	3.12	0.92	2.25	0.	0.
time (sec)	N/A	0.068	0.084	0.137	1.68	2.322	0.	0.

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	203	203	187	413	0	0	0	0
normalized size	1	1.	0.92	2.03	0.	0.	0.	0.
time (sec)	N/A	0.21	0.518	0.154	0.	0.	0.	0.

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	239	462	0	0	0	0
normalized size	1	1.	1.06	2.05	0.	0.	0.	0.
time (sec)	N/A	0.208	2.028	0.222	0.	0.	0.	0.

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	301	301	321	571	0	0	0	0
normalized size	1	1.	1.07	1.9	0.	0.	0.	0.
time (sec)	N/A	0.294	3.932	0.293	0.	0.	0.	0.

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	340	340	193	600	0	0	0	0
normalized size	1	1.	0.57	1.76	0.	0.	0.	0.
time (sec)	N/A	0.405	0.192	0.339	0.	0.	0.	0.

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	265	265	170	489	0	0	0	0
normalized size	1	1.	0.64	1.85	0.	0.	0.	0.
time (sec)	N/A	0.32	0.159	0.28	0.	0.	0.	0.

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	210	371	0	0	0	0
normalized size	1	1.	1.12	1.97	0.	0.	0.	0.
time (sec)	N/A	0.105	0.55	0.14	0.	0.	0.	0.

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	222	464	0	0	0	0
normalized size	1	1.	1.2	2.51	0.	0.	0.	0.
time (sec)	N/A	0.168	0.537	0.201	0.	0.	0.	0.

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	211	1289	0	0	0	0
normalized size	1	1.	1.1	6.75	0.	0.	0.	0.
time (sec)	N/A	0.229	0.738	0.251	0.	0.	0.	0.

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	144	2350	0	1103	0	0
normalized size	1	1.	0.94	15.26	0.	7.16	0.	0.
time (sec)	N/A	0.114	0.17	0.283	0.	2.515	0.	0.

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	231	231	173	3383	0	1296	0	0
normalized size	1	1.	0.75	14.65	0.	5.61	0.	0.
time (sec)	N/A	0.164	0.182	0.361	0.	2.577	0.	0.

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	308	308	197	4560	0	1517	0	0
normalized size	1	1.	0.64	14.81	0.	4.93	0.	0.
time (sec)	N/A	0.213	0.257	0.457	0.	2.658	0.	0.

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	385	385	221	5881	0	1702	0	0
normalized size	1	1.	0.57	15.28	0.	4.42	0.	0.
time (sec)	N/A	0.301	0.24	0.598	0.	2.968	0.	0.

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	375	375	174	1781	0	613	0	0
normalized size	1	1.	0.46	4.75	0.	1.63	0.	0.
time (sec)	N/A	0.293	0.187	0.585	0.	1.96	0.	0.

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	301	301	150	1327	0	513	0	0
normalized size	1	1.	0.5	4.41	0.	1.7	0.	0.
time (sec)	N/A	0.238	0.158	0.41	0.	1.915	0.	0.

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	227	227	126	931	0	427	0	0
normalized size	1	1.	0.56	4.1	0.	1.88	0.	0.
time (sec)	N/A	0.2	0.129	0.264	0.	1.933	0.	0.

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	84	597	117	344	0	0
normalized size	1	1.	0.55	3.9	0.76	2.25	0.	0.
time (sec)	N/A	0.087	0.056	0.175	1.576	2.274	0.	0.

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	278	278	278	525	0	0	0	0
normalized size	1	1.	1.	1.89	0.	0.	0.	0.
time (sec)	N/A	0.327	1.077	0.187	0.	0.	0.	0.

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	297	297	389	574	0	0	0	0
normalized size	1	1.	1.31	1.93	0.	0.	0.	0.
time (sec)	N/A	0.33	2.093	0.227	0.	0.	0.	0.

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	307	307	494	601	0	0	0	0
normalized size	1	1.	1.61	1.96	0.	0.	0.	0.
time (sec)	N/A	0.324	5.753	0.273	0.	0.	0.	0.

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	430	430	220	735	0	0	0	0
normalized size	1	1.	0.51	1.71	0.	0.	0.	0.
time (sec)	N/A	0.553	0.237	0.471	0.	0.	0.	0.

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	351	351	196	620	0	0	0	0
normalized size	1	1.	0.56	1.77	0.	0.	0.	0.
time (sec)	N/A	0.473	0.198	0.313	0.	0.	0.	0.

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	265	265	266	495	0	0	0	0
normalized size	1	1.	1.	1.87	0.	0.	0.	0.
time (sec)	N/A	0.157	0.912	0.186	0.	0.	0.	0.

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	257	593	0	0	0	0
normalized size	1	1.	0.96	2.21	0.	0.	0.	0.
time (sec)	N/A	0.24	0.888	0.25	0.	0.	0.	0.

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	243	1527	0	0	0	0
normalized size	1	1.	0.88	5.51	0.	0.	0.	0.
time (sec)	N/A	0.304	1.514	0.295	0.	0.	0.	0.

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	234	2615	0	0	0	0
normalized size	1	1.	0.84	9.44	0.	0.	0.	0.
time (sec)	N/A	0.354	1.265	0.319	0.	0.	0.	0.

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	203	156	4031	0	1368	0	0
normalized size	1	1.	0.77	19.86	0.	6.74	0.	0.
time (sec)	N/A	0.125	0.212	0.36	0.	2.916	0.	0.

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	282	282	184	5323	0	1609	0	0
normalized size	1	1.	0.65	18.88	0.	5.71	0.	0.
time (sec)	N/A	0.179	0.218	0.477	0.	3.124	0.	0.

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	361	209	6758	0	1871	0	0
normalized size	1	1.	0.58	18.72	0.	5.18	0.	0.
time (sec)	N/A	0.223	0.237	0.648	0.	3.61	0.	0.

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	354	354	160	1775	0	666	0	0
normalized size	1	1.	0.45	5.01	0.	1.88	0.	0.
time (sec)	N/A	0.246	0.2	0.47	0.	2.314	0.	0.

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	278	278	137	1063	0	548	0	0
normalized size	1	1.	0.49	3.82	0.	1.97	0.	0.
time (sec)	N/A	0.203	0.167	0.311	0.	2.253	0.	0.

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	93	921	132	448	0	0
normalized size	1	1.	0.46	4.56	0.65	2.22	0.	0.
time (sec)	N/A	0.091	0.069	0.223	1.654	2.253	0.	0.

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	361	361	394	652	0	0	0	0
normalized size	1	1.	1.09	1.81	0.	0.	0.	0.
time (sec)	N/A	0.463	1.715	0.237	0.	0.	0.	0.

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	386	386	484	704	0	0	0	0
normalized size	1	1.	1.25	1.82	0.	0.	0.	0.
time (sec)	N/A	0.458	5.3	0.273	0.	0.	0.	0.

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	389	389	640	727	0	0	0	0
normalized size	1	1.	1.65	1.87	0.	0.	0.	0.
time (sec)	N/A	0.455	6.132	0.312	0.	0.	0.	0.

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	30	31	41	81	48	36
normalized size	1	1.	0.88	0.91	1.21	2.38	1.41	1.06
time (sec)	N/A	0.031	0.008	0.044	1.57	2.085	22.196	1.195

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	116	87	101	0	0	0	0
normalized size	1	1.71	1.28	1.49	0.	0.	0.	0.
time (sec)	N/A	0.059	0.051	0.043	0.	0.	0.	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	88	88	64	74	140	142	82	123
normalized size	1	1.	0.73	0.84	1.59	1.61	0.93	1.4
time (sec)	N/A	0.152	0.034	0.057	1.626	2.084	2.88	1.277

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	49	95	82	103	65	72
normalized size	1	1.	0.68	1.32	1.14	1.43	0.9	1.
time (sec)	N/A	0.107	0.025	0.046	1.568	2.076	1.577	1.222

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	43	40	101	100	42	72
normalized size	1	1.	0.86	0.8	2.02	2.	0.84	1.44
time (sec)	N/A	0.082	0.011	0.046	1.589	2.048	0.932	1.382

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	29	62	36	59	24	36
normalized size	1	1.	1.	2.14	1.24	2.03	0.83	1.24
time (sec)	N/A	0.041	0.008	0.038	1.539	2.133	0.522	1.402

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	28	10	15
normalized size	1	1.	1.	0.92	1.15	2.15	0.77	1.15
time (sec)	N/A	0.02	0.005	0.004	1.585	1.953	0.439	1.27

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	52	52	71	103	0	0	0	0
normalized size	1	1.	1.37	1.98	0.	0.	0.	0.
time (sec)	N/A	0.084	0.092	0.085	0.	0.	0.	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	28	28	28	32	35	66	0	99
normalized size	1	1.	1.	1.14	1.25	2.36	0.	3.54
time (sec)	N/A	0.061	0.024	0.045	1.573	2.198	0.	1.388

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	98	98	137	178	0	0	0	0
normalized size	1	1.	1.4	1.82	0.	0.	0.	0.
time (sec)	N/A	0.147	0.838	0.172	0.	0.	0.	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	119	665	0	328	0	0
normalized size	1	1.	0.53	2.97	0.	1.46	0.	0.
time (sec)	N/A	0.265	0.072	0.369	0.	2.158	0.	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	161	400	0	0	0	0
normalized size	1	1.	0.8	2.	0.	0.	0.	0.
time (sec)	N/A	0.25	0.805	0.332	0.	0.	0.	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	92	381	0	255	0	0
normalized size	1	1.	0.62	2.57	0.	1.72	0.	0.
time (sec)	N/A	0.159	0.052	0.24	0.	1.839	0.	0.

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	134	285	0	0	0	0
normalized size	1	1.	1.08	2.3	0.	0.	0.	0.
time (sec)	N/A	0.146	1.031	0.186	0.	0.	0.	0.

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	64	159	78	188	0	0
normalized size	1	1.	0.96	2.37	1.16	2.81	0.	0.
time (sec)	N/A	0.061	0.032	0.093	1.681	1.802	0.	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	50	86	0	0	0	0
normalized size	1	1.	1.02	1.76	0.	0.	0.	0.
time (sec)	N/A	0.051	0.062	0.038	0.	0.	0.	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	145	145	146	180	0	0	0	0
normalized size	1	1.	1.01	1.24	0.	0.	0.	0.
time (sec)	N/A	0.194	0.29	0.101	0.	0.	0.	0.

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	69	216	0	487	0	0
normalized size	1	1.	1.05	3.27	0.	7.38	0.	0.
time (sec)	N/A	0.09	0.124	0.148	0.	2.098	0.	0.

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	229	229	244	461	0	0	0	0
normalized size	1	1.	1.07	2.01	0.	0.	0.	0.
time (sec)	N/A	0.299	2.299	0.221	0.	0.	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	152	849	0	895	0	0
normalized size	1	1.	1.03	5.78	0.	6.09	0.	0.
time (sec)	N/A	0.188	0.203	0.237	0.	2.251	0.	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	229	166	423	0	942	0	0
normalized size	1	1.04	0.75	1.91	0.	4.26	0.	0.
time (sec)	N/A	0.291	0.289	0.334	0.	2.229	0.	0.

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	173	436	0	0	0	0
normalized size	1	1.	0.81	2.04	0.	0.	0.	0.
time (sec)	N/A	0.287	0.468	0.301	0.	0.	0.	0.

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F(-2)	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	146	136	306	0	810	0	0
normalized size	1	1.03	0.96	2.15	0.	5.7	0.	0.
time (sec)	N/A	0.18	0.207	0.214	0.	2.119	0.	0.

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	160	274	0	0	0	0
normalized size	1	1.	1.19	2.03	0.	0.	0.	0.
time (sec)	N/A	0.159	0.196	0.164	0.	0.	0.	0.

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	51	194	0	595	0	0
normalized size	1	1.	0.7	2.66	0.	8.15	0.	0.
time (sec)	N/A	0.07	0.027	0.095	0.	2.115	0.	0.

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	77	177	93	0	0	0
normalized size	1	1.	0.96	2.21	1.16	0.	0.	0.
time (sec)	N/A	0.036	0.203	0.086	1.702	0.	0.	0.

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	300	344	0	0	0	0
normalized size	1	1.	1.36	1.56	0.	0.	0.	0.
time (sec)	N/A	0.311	0.998	0.132	0.	0.	0.	0.

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	117	239	0	0	0	0
normalized size	1	1.	0.78	1.59	0.	0.	0.	0.
time (sec)	N/A	0.155	0.228	0.147	0.	0.	0.	0.

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	316	316	404	474	0	0	0	0
normalized size	1	1.	1.28	1.5	0.	0.	0.	0.
time (sec)	N/A	0.441	2.12	0.23	0.	0.	0.	0.

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	238	238	162	1045	0	0	0	0
normalized size	1	1.	0.68	4.39	0.	0.	0.	0.
time (sec)	N/A	0.292	0.312	0.25	0.	0.	0.	0.

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	293	293	253	1716	0	0	0	0
normalized size	1	1.	0.86	5.86	0.	0.	0.	0.
time (sec)	N/A	0.443	0.634	0.403	0.	0.	0.	0.

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	219	234	169	459	0	1045	0	0
normalized size	1	1.07	0.77	2.1	0.	4.77	0.	0.
time (sec)	N/A	0.316	0.307	0.316	0.	2.424	0.	0.

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	212	212	213	1510	0	0	0	0
normalized size	1	1.	1.	7.12	0.	0.	0.	0.
time (sec)	N/A	0.302	0.424	0.277	0.	0.	0.	0.

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	A	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	155	143	307	216	913	0	0
normalized size	1	1.03	0.95	2.05	1.44	6.09	0.	0.
time (sec)	N/A	0.197	0.229	0.218	1.621	2.3	0.	0.

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	125	125	103	1219	207	0	0	0
normalized size	1	1.	0.82	9.75	1.66	0.	0.	0.
time (sec)	N/A	0.131	0.193	0.204	1.674	0.	0.	0.

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-1)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	85	259	0	815	0	0
normalized size	1	1.	0.71	2.18	0.	6.85	0.	0.
time (sec)	N/A	0.081	0.046	0.13	0.	2.198	0.	0.

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	113	1071	190	0	0	0
normalized size	1	1.	0.73	6.95	1.23	0.	0.	0.
time (sec)	N/A	0.079	0.238	0.125	1.769	0.	0.	0.

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	291	291	456	449	0	0	0	0
normalized size	1	1.	1.57	1.54	0.	0.	0.	0.
time (sec)	N/A	0.437	2.001	0.154	0.	0.	0.	0.

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	188	1346	0	0	0	0
normalized size	1	1.	0.84	6.01	0.	0.	0.	0.
time (sec)	N/A	0.22	0.297	0.204	0.	0.	0.	0.

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	433	433	537	624	0	0	0	0
normalized size	1	1.	1.24	1.44	0.	0.	0.	0.
time (sec)	N/A	0.582	7.483	0.279	0.	0.	0.	0.

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	310	310	213	1875	0	0	0	0
normalized size	1	1.	0.69	6.05	0.	0.	0.	0.
time (sec)	N/A	0.387	0.345	0.261	0.	0.	0.	0.

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	210	111	409	209	0	0	173
normalized size	1	1.	0.53	1.95	1.	0.	0.	0.82
time (sec)	N/A	0.115	0.216	0.217	1.706	0.	0.	1.431

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	68	0	0	0	0	0
normalized size	1	1.	0.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.102	0.051	0.247	0.	0.	0.	0.

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	97	0	0	0	0	0
normalized size	1	1.	0.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.216	0.042	0.529	0.	0.	0.	0.

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	315	315	256	0	0	0	0	0
normalized size	1	1.	0.81	0.	0.	0.	0.	0.
time (sec)	N/A	2.164	0.55	8.282	0.	0.	0.	0.

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	187	0	0	0	0	0
normalized size	1	1.	0.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.306	0.015	5.034	0.	0.	0.	0.

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	118	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	0.141	0.082	2.898	0.	0.	0.	0.

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.064	3.924	0.539	0.	0.	0.	0.

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	116	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.155	5.701	0.54	0.	0.	0.	0.

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	207	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.248	6.113	0.606	0.	0.	0.	0.

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	635	635	338	0	0	0	0	0
normalized size	1	1.	0.53	0.	0.	0.	0.	0.
time (sec)	N/A	0.559	1.316	4.455	0.	0.	0.	0.

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	399	399	237	0	0	0	0	0
normalized size	1	1.	0.59	0.	0.	0.	0.	0.
time (sec)	N/A	0.332	0.604	2.572	0.	0.	0.	0.

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	181	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.202	0.073	1.957	0.	0.	0.	0.

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	129	0	0	0	0	0
normalized size	1	1.	0.79	0.	0.	0.	0.	0.
time (sec)	N/A	0.197	0.063	0.905	0.	0.	0.	0.

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	272	272	207	0	0	0	0	0
normalized size	1	1.	0.76	0.	0.	0.	0.	0.
time (sec)	N/A	0.315	0.247	0.575	0.	0.	0.	0.

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	408	408	279	0	0	0	0	0
normalized size	1	1.	0.68	0.	0.	0.	0.	0.
time (sec)	N/A	0.455	0.381	0.602	0.	0.	0.	0.

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	95	0	0	0	0	0
normalized size	1	1.	0.95	0.	0.	0.	0.	0.
time (sec)	N/A	0.07	0.037	0.513	0.	0.	0.	0.

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	290	290	203	276	612	559	388	668
normalized size	1	1.	0.7	0.95	2.11	1.93	1.34	2.3
time (sec)	N/A	0.461	0.265	0.111	1.68	1.895	17.71	1.469

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	192	306	0	470	332	535
normalized size	1	1.	0.95	1.51	0.	2.33	1.64	2.65
time (sec)	N/A	0.537	0.162	0.044	0.	1.903	12.183	1.372

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	179	280	478	456	313	481
normalized size	1	1.	0.85	1.33	2.27	2.16	1.48	2.28
time (sec)	N/A	0.337	0.219	0.087	1.658	1.8	6.337	1.514

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	157	206	0	396	269	321
normalized size	1	1.	1.14	1.49	0.	2.87	1.95	2.33
time (sec)	N/A	0.133	0.288	0.078	0.	1.94	4.003	1.451

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	137	173	315	335	224	265
normalized size	1	1.	1.07	1.35	2.46	2.62	1.75	2.07
time (sec)	N/A	0.137	0.203	0.033	1.677	1.817	1.745	1.454

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	178	178	236	459	0	0	0	0
normalized size	1	1.	1.33	2.58	0.	0.	0.	0.
time (sec)	N/A	0.238	0.453	0.229	0.	0.	0.	0.

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	149	149	203	269	0	0	0	0
normalized size	1	1.	1.36	1.81	0.	0.	0.	0.
time (sec)	N/A	0.298	0.41	0.221	0.	0.	0.	0.

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	193	193	236	564	0	0	0	0
normalized size	1	1.	1.22	2.92	0.	0.	0.	0.
time (sec)	N/A	0.287	0.393	0.337	0.	0.	0.	0.

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	176	176	266	291	0	0	0	0
normalized size	1	1.	1.51	1.65	0.	0.	0.	0.
time (sec)	N/A	0.377	0.743	0.361	0.	0.	0.	0.

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	395	395	253	531	1054	810	563	948
normalized size	1	1.	0.64	1.34	2.67	2.05	1.43	2.4
time (sec)	N/A	0.724	0.247	0.159	1.766	1.9	57.558	1.583

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	302	302	239	424	0	729	515	711
normalized size	1	1.	0.79	1.4	0.	2.41	1.71	2.35
time (sec)	N/A	1.008	0.239	0.139	0.	1.882	38.141	1.572

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	310	310	229	400	856	697	483	747
normalized size	1	1.	0.74	1.29	2.76	2.25	1.56	2.41
time (sec)	N/A	0.571	0.217	0.044	1.868	1.901	19.886	1.47

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	209	209	209	283	0	609	430	482
normalized size	1	1.	1.	1.35	0.	2.91	2.06	2.31
time (sec)	N/A	0.198	0.286	0.038	0.	1.803	13.713	1.485

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	219	219	193	275	628	560	389	505
normalized size	1	1.	0.88	1.26	2.87	2.56	1.78	2.31
time (sec)	N/A	0.256	0.258	0.037	1.758	1.876	7.153	1.446

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	271	271	353	623	0	0	0	0
normalized size	1	1.	1.3	2.3	0.	0.	0.	0.
time (sec)	N/A	0.415	0.479	0.307	0.	0.	0.	0.

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	249	249	322	417	0	0	0	0
normalized size	1	1.	1.29	1.67	0.	0.	0.	0.
time (sec)	N/A	0.493	1.03	0.257	0.	0.	0.	0.

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	287	287	343	767	0	0	0	0
normalized size	1	1.	1.2	2.67	0.	0.	0.	0.
time (sec)	N/A	0.475	0.881	0.525	0.	0.	0.	0.

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	268	268	374	425	0	0	0	0
normalized size	1	1.	1.4	1.59	0.	0.	0.	0.
time (sec)	N/A	0.675	0.822	0.421	0.	0.	0.	0.

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	476	476	301	672	1540	1071	702	1168
normalized size	1	1.	0.63	1.41	3.24	2.25	1.47	2.45
time (sec)	N/A	1.018	0.435	0.116	1.949	1.987	123.868	1.441

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	384	384	287	519	0	938	654	840
normalized size	1	1.	0.75	1.35	0.	2.44	1.7	2.19
time (sec)	N/A	1.594	0.438	0.105	0.	2.028	95.649	1.393

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	391	391	277	525	1277	903	626	967
normalized size	1	1.	0.71	1.34	3.27	2.31	1.6	2.47
time (sec)	N/A	0.823	0.382	0.054	1.822	2.002	55.645	1.417

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	257	358	0	799	573	610
normalized size	1	1.	0.96	1.34	0.	2.98	2.14	2.28
time (sec)	N/A	0.247	0.337	0.041	0.	2.024	38.386	1.471

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	298	298	241	384	984	759	524	713
normalized size	1	1.	0.81	1.29	3.3	2.55	1.76	2.39
time (sec)	N/A	0.372	0.431	0.042	1.701	1.931	21.189	1.486

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	354	354	448	743	0	0	0	0
normalized size	1	1.	1.27	2.1	0.	0.	0.	0.
time (sec)	N/A	0.658	0.826	0.382	0.	0.	0.	0.

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	329	329	483	535	0	0	0	0
normalized size	1	1.	1.47	1.63	0.	0.	0.	0.
time (sec)	N/A	0.706	1.25	0.336	0.	0.	0.	0.

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	371	371	494	888	0	0	0	0
normalized size	1	1.	1.33	2.39	0.	0.	0.	0.
time (sec)	N/A	0.723	1.385	0.682	0.	0.	0.	0.

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	348	348	480	547	0	0	0	0
normalized size	1	1.	1.38	1.57	0.	0.	0.	0.
time (sec)	N/A	0.981	0.999	0.526	0.	0.	0.	0.

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	297	297	508	0	0	0	0	0
normalized size	1	1.	1.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.549	0.825	0.418	0.	0.	0.	0.

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	210	210	441	416	0	0	0	0
normalized size	1	1.	2.1	1.98	0.	0.	0.	0.
time (sec)	N/A	0.378	0.397	0.243	0.	0.	0.	0.

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	218	218	317	0	0	0	0	0
normalized size	1	1.	1.45	0.	0.	0.	0.	0.
time (sec)	N/A	0.287	0.304	0.209	0.	0.	0.	0.

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	117	117	143	258	0	0	0	0
normalized size	1	1.	1.22	2.21	0.	0.	0.	0.
time (sec)	N/A	0.172	0.08	0.063	0.	0.	0.	0.

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	156	156	207	404	0	0	0	0
normalized size	1	1.	1.33	2.59	0.	0.	0.	0.
time (sec)	N/A	0.127	0.509	0.106	0.	0.	0.	0.

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	131	131	254	529	0	0	0	0
normalized size	1	1.	1.94	4.04	0.	0.	0.	0.
time (sec)	N/A	0.197	0.195	0.092	0.	0.	0.	0.

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	238	238	391	575	0	0	0	0
normalized size	1	1.	1.64	2.42	0.	0.	0.	0.
time (sec)	N/A	0.348	0.714	0.21	0.	0.	0.	0.

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	210	210	353	793	0	0	0	0
normalized size	1	1.	1.68	3.78	0.	0.	0.	0.
time (sec)	N/A	0.383	1.196	0.262	0.	0.	0.	0.

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	333	333	849	725	0	0	0	0
normalized size	1	1.	2.55	2.18	0.	0.	0.	0.
time (sec)	N/A	0.654	7.819	0.312	0.	0.	0.	0.

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	300	300	614	705	0	0	0	0
normalized size	1	1.	2.05	2.35	0.	0.	0.	0.
time (sec)	N/A	0.525	3.104	0.409	0.	0.	0.	0.

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	227	227	502	585	0	0	0	0
normalized size	1	1.	2.21	2.58	0.	0.	0.	0.
time (sec)	N/A	0.395	1.059	0.327	0.	0.	0.	0.

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	233	233	383	599	0	0	0	0
normalized size	1	1.	1.64	2.57	0.	0.	0.	0.
time (sec)	N/A	0.299	2.631	0.267	0.	0.	0.	0.

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	75	205	495	230	0	275
normalized size	1	1.	0.84	2.3	5.56	2.58	0.	3.09
time (sec)	N/A	0.099	0.19	0.03	1.678	2.65	0.	1.56

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	230	230	359	593	0	0	0	0
normalized size	1	1.	1.56	2.58	0.	0.	0.	0.
time (sec)	N/A	0.236	2.604	0.15	0.	0.	0.	0.

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	211	211	365	829	0	0	0	0
normalized size	1	1.	1.73	3.93	0.	0.	0.	0.
time (sec)	N/A	0.365	1.271	0.244	0.	0.	0.	0.

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	324	324	1059	778	0	0	0	0
normalized size	1	1.	3.27	2.4	0.	0.	0.	0.
time (sec)	N/A	0.563	9.57	0.301	0.	0.	0.	0.

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	270	270	430	903	0	0	0	0
normalized size	1	1.	1.59	3.34	0.	0.	0.	0.
time (sec)	N/A	0.551	1.558	0.246	0.	0.	0.	0.

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	439	439	1514	1019	0	0	0	0
normalized size	1	1.	3.45	2.32	0.	0.	0.	0.
time (sec)	N/A	0.949	12.927	0.382	0.	0.	0.	0.

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	343	343	667	903	0	0	0	0
normalized size	1	1.	1.94	2.63	0.	0.	0.	0.
time (sec)	N/A	0.536	6.377	0.547	0.	0.	0.	0.

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	172	172	192	472	0	421	0	429
normalized size	1	1.	1.12	2.74	0.	2.45	0.	2.49
time (sec)	N/A	0.334	0.186	0.353	0.	2.651	0.	2.136

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	341	341	446	894	0	0	0	0
normalized size	1	1.	1.31	2.62	0.	0.	0.	0.
time (sec)	N/A	0.422	4.379	0.437	0.	0.	0.	0.

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	162	335	0	360	0	533
normalized size	1	1.	1.08	2.23	0.	2.4	0.	3.55
time (sec)	N/A	0.137	0.197	0.036	0.	2.716	0.	1.465

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	332	332	556	890	0	0	0	0
normalized size	1	1.	1.67	2.68	0.	0.	0.	0.
time (sec)	N/A	0.351	5.804	0.233	0.	0.	0.	0.

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	296	296	459	1224	0	0	0	0
normalized size	1	1.	1.55	4.14	0.	0.	0.	0.
time (sec)	N/A	0.491	3.681	0.31	0.	0.	0.	0.

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F(-1)	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	429	429	1351	1093	0	0	0	0
normalized size	1	1.	3.15	2.55	0.	0.	0.	0.
time (sec)	N/A	0.759	11.566	0.392	0.	0.	0.	0.

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	403	403	569	1547	0	0	0	0
normalized size	1	1.	1.41	3.84	0.	0.	0.	0.
time (sec)	N/A	0.784	6.613	0.396	0.	0.	0.	0.

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F(-1)	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	572	572	1657	1352	0	0	0	0
normalized size	1	1.	2.9	2.36	0.	0.	0.	0.
time (sec)	N/A	1.321	12.034	0.494	0.	0.	0.	0.

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	374	374	242	1238	0	610	0	0
normalized size	1	1.	0.65	3.31	0.	1.63	0.	0.
time (sec)	N/A	0.47	0.283	0.428	0.	2.671	0.	0.

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	303	303	246	812	0	0	0	0
normalized size	1	1.	0.81	2.68	0.	0.	0.	0.
time (sec)	N/A	0.384	0.321	0.331	0.	0.	0.	0.

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	120	700	254	450	0	0
normalized size	1	1.	0.64	3.72	1.35	2.39	0.	0.
time (sec)	N/A	0.159	0.259	0.226	1.688	2.491	0.	0.

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	192	192	128	564	0	0	0	0
normalized size	1	1.	0.67	2.94	0.	0.	0.	0.
time (sec)	N/A	0.115	0.214	0.169	0.	0.	0.	0.

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	378	378	391	1017	0	0	0	0
normalized size	1	1.	1.03	2.69	0.	0.	0.	0.
time (sec)	N/A	0.349	1.116	0.274	0.	0.	0.	0.

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	227	227	257	762	0	0	0	0
normalized size	1	1.	1.13	3.36	0.	0.	0.	0.
time (sec)	N/A	0.32	0.977	0.27	0.	0.	0.	0.

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	398	398	480	1082	0	0	0	0
normalized size	1	1.	1.21	2.72	0.	0.	0.	0.
time (sec)	N/A	0.382	5.063	0.342	0.	0.	0.	0.

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	314	314	248	3017	0	0	0	0
normalized size	1	1.	0.79	9.61	0.	0.	0.	0.
time (sec)	N/A	0.272	1.189	0.361	0.	0.	0.	0.

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	503	503	244	1882	0	853	0	0
normalized size	1	1.	0.49	3.74	0.	1.7	0.	0.
time (sec)	N/A	0.78	0.304	0.497	0.	2.794	0.	0.

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	421	421	297	1075	0	0	0	0
normalized size	1	1.	0.71	2.55	0.	0.	0.	0.
time (sec)	N/A	0.71	0.313	0.48	0.	0.	0.	0.

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	279	279	159	1224	319	657	0	0
normalized size	1	1.	0.57	4.39	1.14	2.35	0.	0.
time (sec)	N/A	0.228	0.18	0.306	1.678	2.955	0.	0.

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	305	307	329	820	0	0	0	0
normalized size	1	1.01	1.08	2.69	0.	0.	0.	0.
time (sec)	N/A	0.24	1.117	0.243	0.	0.	0.	0.

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	545	545	576	1276	0	0	0	0
normalized size	1	1.	1.06	2.34	0.	0.	0.	0.
time (sec)	N/A	0.604	2.482	0.322	0.	0.	0.	0.

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	424	424	396	1148	0	0	0	0
normalized size	1	1.	0.93	2.71	0.	0.	0.	0.
time (sec)	N/A	0.404	2.419	0.324	0.	0.	0.	0.

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	590	590	854	1372	0	0	0	0
normalized size	1	1.	1.45	2.33	0.	0.	0.	0.
time (sec)	N/A	0.612	7.056	0.398	0.	0.	0.	0.

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	400	400	493	3281	0	0	0	0
normalized size	1	1.	1.23	8.2	0.	0.	0.	0.
time (sec)	N/A	0.555	1.82	0.388	0.	0.	0.	0.

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	651	651	270	2146	0	1088	0	0
normalized size	1	1.	0.41	3.3	0.	1.67	0.	0.
time (sec)	N/A	1.246	0.417	0.518	0.	2.468	0.	0.

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	556	556	348	1375	0	0	0	0
normalized size	1	1.	0.63	2.47	0.	0.	0.	0.
time (sec)	N/A	1.107	0.463	0.571	0.	0.	0.	0.

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	382	382	216	1888	379	888	0	0
normalized size	1	1.	0.57	4.94	0.99	2.32	0.	0.
time (sec)	N/A	0.293	0.324	0.402	1.625	1.979	0.	0.

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	438	438	407	1107	0	0	0	0
normalized size	1	1.	0.93	2.53	0.	0.	0.	0.
time (sec)	N/A	0.387	1.818	0.326	0.	0.	0.	0.

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	687	687	775	1574	0	0	0	0
normalized size	1	1.	1.13	2.29	0.	0.	0.	0.
time (sec)	N/A	0.886	4.532	0.415	0.	0.	0.	0.

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	561	561	586	1446	0	0	0	0
normalized size	1	1.	1.04	2.58	0.	0.	0.	0.
time (sec)	N/A	0.603	2.079	0.411	0.	0.	0.	0.

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	740	740	1073	1674	0	0	0	0
normalized size	1	1.	1.45	2.26	0.	0.	0.	0.
time (sec)	N/A	0.955	7.193	0.481	0.	0.	0.	0.

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	591	591	690	3855	0	0	0	0
normalized size	1	1.	1.17	6.52	0.	0.	0.	0.
time (sec)	N/A	0.883	3.563	0.465	0.	0.	0.	0.

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	400	400	230	1304	0	628	0	0
normalized size	1	1.	0.57	3.26	0.	1.57	0.	0.
time (sec)	N/A	0.583	0.168	0.597	0.	2.005	0.	0.

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	337	337	283	871	0	0	0	0
normalized size	1	1.	0.84	2.58	0.	0.	0.	0.
time (sec)	N/A	0.484	1.387	0.476	0.	0.	0.	0.

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	176	750	0	456	0	0
normalized size	1	1.	0.64	2.71	0.	1.65	0.	0.
time (sec)	N/A	0.329	0.124	0.394	0.	2.019	0.	0.

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	213	210	612	0	0	0	0
normalized size	1	1.03	1.02	2.97	0.	0.	0.	0.
time (sec)	N/A	0.269	1.185	0.271	0.	0.	0.	0.

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	146	146	86	316	176	312	0	0
normalized size	1	1.	0.59	2.16	1.21	2.14	0.	0.
time (sec)	N/A	0.122	0.086	0.142	1.591	1.862	0.	0.

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	64	143	0	0	0	0
normalized size	1	1.	1.31	2.92	0.	0.	0.	0.
time (sec)	N/A	0.091	0.168	0.053	0.	0.	0.	0.

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	257	257	301	387	0	0	0	0
normalized size	1	1.	1.17	1.51	0.	0.	0.	0.
time (sec)	N/A	0.341	0.614	0.152	0.	0.	0.	0.

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	183	183	159	638	0	0	0	0
normalized size	1	1.	0.87	3.49	0.	0.	0.	0.
time (sec)	N/A	0.22	0.385	0.209	0.	0.	0.	0.

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	402	402	487	1107	0	0	0	0
normalized size	1	1.	1.21	2.75	0.	0.	0.	0.
time (sec)	N/A	0.519	5.418	0.322	0.	0.	0.	0.

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	319	319	269	2320	0	0	0	0
normalized size	1	1.	0.84	7.27	0.	0.	0.	0.
time (sec)	N/A	0.39	0.671	0.336	0.	0.	0.	0.

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	549	549	453	1089	0	0	0	0
normalized size	1	1.	0.83	1.98	0.	0.	0.	0.
time (sec)	N/A	0.741	0.682	0.546	0.	0.	0.	0.

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	424	424	312	976	0	0	0	0
normalized size	1	1.	0.74	2.3	0.	0.	0.	0.
time (sec)	N/A	0.643	2.185	0.546	0.	0.	0.	0.

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	412	412	369	830	0	0	0	0
normalized size	1	1.	0.9	2.01	0.	0.	0.	0.
time (sec)	N/A	0.454	0.534	0.346	0.	0.	0.	0.

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	250	250	295	581	0	0	0	0
normalized size	1	1.	1.18	2.32	0.	0.	0.	0.
time (sec)	N/A	0.357	0.568	0.237	0.	0.	0.	0.

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	276	540	0	0	0	0
normalized size	1	1.	1.33	2.6	0.	0.	0.	0.
time (sec)	N/A	0.186	0.542	0.133	0.	0.	0.	0.

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	195	195	165	425	0	0	0	0
normalized size	1	1.	0.85	2.18	0.	0.	0.	0.
time (sec)	N/A	0.161	0.502	0.119	0.	0.	0.	0.

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	467	467	667	1096	0	0	0	0
normalized size	1	1.	1.43	2.35	0.	0.	0.	0.
time (sec)	N/A	0.573	1.943	0.244	0.	0.	0.	0.

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	333	333	322	807	0	0	0	0
normalized size	1	1.	0.97	2.42	0.	0.	0.	0.
time (sec)	N/A	0.437	0.704	0.207	0.	0.	0.	0.

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	634	634	844	1490	0	0	0	0
normalized size	1	1.	1.33	2.35	0.	0.	0.	0.
time (sec)	N/A	0.928	8.161	0.383	0.	0.	0.	0.

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	483	483	462	2845	0	0	0	0
normalized size	1	1.	0.96	5.89	0.	0.	0.	0.
time (sec)	N/A	0.804	0.853	0.372	0.	0.	0.	0.

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	546	546	594	1201	0	0	0	0
normalized size	1	1.	1.09	2.2	0.	0.	0.	0.
time (sec)	N/A	0.865	1.542	0.523	0.	0.	0.	0.

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	421	421	374	3907	0	0	0	0
normalized size	1	1.	0.89	9.28	0.	0.	0.	0.
time (sec)	N/A	0.726	1.485	0.556	0.	0.	0.	0.

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-1)	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	332	332	511	829	0	0	0	0
normalized size	1	1.	1.54	2.5	0.	0.	0.	0.
time (sec)	N/A	0.489	0.834	0.283	0.	0.	0.	0.

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	332	332	303	3277	0	0	0	0
normalized size	1	1.	0.91	9.87	0.	0.	0.	0.
time (sec)	N/A	0.352	0.803	0.303	0.	0.	0.	0.

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	294	294	461	762	0	0	0	0
normalized size	1	1.	1.57	2.59	0.	0.	0.	0.
time (sec)	N/A	0.218	1.177	0.187	0.	0.	0.	0.

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	311	311	320	2896	0	0	0	0
normalized size	1	1.	1.03	9.31	0.	0.	0.	0.
time (sec)	N/A	0.276	0.992	0.205	0.	0.	0.	0.

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	577	577	935	1373	0	0	0	0
normalized size	1	1.	1.62	2.38	0.	0.	0.	0.
time (sec)	N/A	0.86	8.644	0.319	0.	0.	0.	0.

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	452	452	352	3777	0	0	0	0
normalized size	1	1.	0.78	8.36	0.	0.	0.	0.
time (sec)	N/A	0.617	2.585	0.316	0.	0.	0.	0.

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	752	752	1090	1876	0	0	0	0
normalized size	1	1.	1.45	2.49	0.	0.	0.	0.
time (sec)	N/A	1.256	10.64	0.468	0.	0.	0.	0.

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	538	538	441	5229	0	0	0	0
normalized size	1	1.	0.82	9.72	0.	0.	0.	0.
time (sec)	N/A	1.053	3.587	0.381	0.	0.	0.	0.

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	100	129	0	205	146	193
normalized size	1	1.	0.64	0.82	0.	1.31	0.93	1.23
time (sec)	N/A	0.271	0.052	0.063	0.	1.738	4.832	1.266

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	81	127	142	154	121	138
normalized size	1	1.	0.64	1.01	1.13	1.22	0.96	1.1
time (sec)	N/A	0.202	0.045	0.055	1.551	1.785	2.701	1.227

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	73	71	0	150	78	109
normalized size	1	1.	0.82	0.8	0.	1.69	0.88	1.22
time (sec)	N/A	0.137	0.024	0.062	0.	1.732	1.502	1.248

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	51	80	66	89	49	66
normalized size	1	1.	0.93	1.45	1.2	1.62	0.89	1.2
time (sec)	N/A	0.072	0.013	0.044	1.497	1.686	0.875	1.276

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	28	10	15
normalized size	1	1.	1.	0.92	1.15	2.15	0.77	1.15
time (sec)	N/A	0.034	0.004	0.003	1.519	1.624	0.475	1.254

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	92	92	116	161	0	0	0	0
normalized size	1	1.	1.26	1.75	0.	0.	0.	0.
time (sec)	N/A	0.143	0.103	0.06	0.	0.	0.	0.

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	72	148	0	0	0	0
normalized size	1	1.	0.95	1.95	0.	0.	0.	0.
time (sec)	N/A	0.144	0.261	0.107	0.	0.	0.	0.

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	163	163	194	269	0	0	0	0
normalized size	1	1.	1.19	1.65	0.	0.	0.	0.
time (sec)	N/A	0.255	1.336	0.155	0.	0.	0.	0.

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	52	0	0	0	0
normalized size	1	1.	1.	1.24	0.	0.	0.	0.
time (sec)	N/A	0.068	0.054	0.039	0.	0.	0.	0.

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	108	169	0	0	0	0
normalized size	1	1.	0.6	0.94	0.	0.	0.	0.
time (sec)	N/A	0.129	0.221	0.102	0.	0.	0.	0.

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	283	283	149	365	0	0	0	0
normalized size	1	1.	0.53	1.29	0.	0.	0.	0.
time (sec)	N/A	0.217	0.586	0.167	0.	0.	0.	0.

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	390	390	234	556	0	0	0	0
normalized size	1	1.	0.6	1.43	0.	0.	0.	0.
time (sec)	N/A	0.329	0.81	0.207	0.	0.	0.	0.

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F(-2)	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	1312	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.083	3.468	14.642	0.	0.	0.	0.

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F(-2)	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	756	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.081	0.142	7.016	0.	0.	0.	0.

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F(-2)	F	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	371	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.049	0.092	2.915	0.	0.	0.	0.

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.091	6.466	0.463	0.	0.	0.	0.

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	279	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.408	7.96	0.526	0.	0.	0.	0.

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	668	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.913	9.125	0.605	0.	0.	0.	0.

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	957	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.157	4.441	7.355	0.	0.	0.	0.

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	499	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.152	0.154	3.022	0.	0.	0.	0.

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	203	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.139	0.101	1.239	0.	0.	0.	0.

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.151	3.131	0.637	0.	0.	0.	0.

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.166	4.27	0.595	0.	0.	0.	0.

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.166	4.319	0.622	0.	0.	0.	0.

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.095	0.862	0.497	0.	0.	0.	0.

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	370	370	171	278	383	512	355	512
normalized size	1	1.	0.46	0.75	1.04	1.38	0.96	1.38
time (sec)	N/A	0.7	0.323	0.078	1.567	1.797	25.739	1.46

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	273	273	139	206	292	375	262	360
normalized size	1	1.	0.51	0.75	1.07	1.37	0.96	1.32
time (sec)	N/A	0.407	0.216	0.052	1.572	1.713	8.794	1.442

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	158	158	101	132	173	225	150	188
normalized size	1	1.	0.64	0.84	1.09	1.42	0.95	1.19
time (sec)	N/A	0.211	0.09	0.041	1.586	1.616	2.451	1.383

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	162	0	49	0	0	0
normalized size	1	1.	0.81	0.	0.24	0.	0.	0.
time (sec)	N/A	0.134	0.182	0.1	2.247	0.	0.	0.

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	337	337	234	486	77	0	0	0
normalized size	1	1.	0.69	1.44	0.23	0.	0.	0.
time (sec)	N/A	0.296	0.404	0.149	2.654	0.	0.	0.

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	455	455	1544	726	105	0	0	0
normalized size	1	1.	3.39	1.6	0.23	0.	0.	0.
time (sec)	N/A	0.507	12.441	0.224	3.319	0.	0.	0.

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	533	533	179	875	0	0	0	0
normalized size	1	1.	0.34	1.64	0.	0.	0.	0.
time (sec)	N/A	0.547	0.8	0.247	0.	0.	0.	0.

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	365	138	533	0	0	0	0
normalized size	1	1.	0.38	1.46	0.	0.	0.	0.
time (sec)	N/A	0.322	0.313	0.161	0.	0.	0.	0.

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	215	215	114	260	0	0	0	0
normalized size	1	1.	0.53	1.21	0.	0.	0.	0.
time (sec)	N/A	0.165	0.057	0.139	0.	0.	0.	0.

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	52	0	0	0	0
normalized size	1	1.	1.	1.24	0.	0.	0.	0.
time (sec)	N/A	0.069	0.043	0.03	0.	0.	0.	0.

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	238	238	157	203	76	0	0	0
normalized size	1	1.	0.66	0.85	0.32	0.	0.	0.
time (sec)	N/A	0.175	0.252	0.101	4.002	0.	0.	0.

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	388	388	211	661	143	0	0	0
normalized size	1	1.	0.54	1.7	0.37	0.	0.	0.
time (sec)	N/A	0.306	0.559	0.207	2.705	0.	0.	0.

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	547	547	319	1017	0	0	0	0
normalized size	1	1.	0.58	1.86	0.	0.	0.	0.
time (sec)	N/A	0.481	0.727	0.283	0.	0.	0.	0.

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.083	0.861	0.485	0.	0.	0.	0.

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	125	159	0	273	185	259
normalized size	1	1.	0.65	0.83	0.	1.43	0.97	1.36
time (sec)	N/A	0.468	0.062	0.068	0.	1.672	8.675	1.46

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	100	180	177	209	148	174
normalized size	1	1.	0.64	1.15	1.13	1.33	0.94	1.11
time (sec)	N/A	0.321	0.052	0.056	1.61	1.697	4.781	1.471

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	85	85	0	185	100	146
normalized size	1	1.	0.79	0.79	0.	1.73	0.93	1.36
time (sec)	N/A	0.207	0.03	0.066	0.	1.649	2.788	1.436

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	61	107	86	119	61	84
normalized size	1	1.	0.91	1.6	1.28	1.78	0.91	1.25
time (sec)	N/A	0.105	0.017	0.046	1.512	1.929	1.416	1.415

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	28	10	15
normalized size	1	1.	1.	0.92	1.15	2.15	0.77	1.15
time (sec)	N/A	0.03	0.004	0.005	1.473	1.819	0.862	1.38

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	138	138	180	221	0	0	0	0
normalized size	1	1.	1.3	1.6	0.	0.	0.	0.
time (sec)	N/A	0.16	0.15	0.066	0.	0.	0.	0.

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	99	99	108	208	0	0	0	0
normalized size	1	1.	1.09	2.1	0.	0.	0.	0.
time (sec)	N/A	0.182	0.209	0.105	0.	0.	0.	0.

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	264	264	317	428	0	0	0	0
normalized size	1	1.	1.2	1.62	0.	0.	0.	0.
time (sec)	N/A	0.357	4.432	0.167	0.	0.	0.	0.

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	43	42	0	0	0	80
normalized size	1	1.	0.64	0.63	0.	0.	0.	1.19
time (sec)	N/A	0.105	0.116	0.044	0.	0.	0.	1.406

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	34	33	0	0	0	59
normalized size	1	1.	0.68	0.66	0.	0.	0.	1.18
time (sec)	N/A	0.09	0.078	0.028	0.	0.	0.	1.356

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	23	22	0	0	0	34
normalized size	1	1.	0.79	0.76	0.	0.	0.	1.17
time (sec)	N/A	0.064	0.019	0.028	0.	0.	0.	1.325

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.024	2.533	0.099	0.	0.	0.	0.

Problem 315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.024	7.68	0.259	0.	0.	0.	0.

Problem 316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	152	193	0	0	0	637
normalized size	1	1.	0.74	0.94	0.	0.	0.	3.09
time (sec)	N/A	0.46	0.423	0.057	0.	0.	0.	1.489

Problem 317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	179	135	138	0	0	0	486
normalized size	1	0.98	0.74	0.75	0.	0.	0.	2.66
time (sec)	N/A	0.43	0.323	0.048	0.	0.	0.	1.374

Problem 318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	66	77	0	0	0	228
normalized size	1	1.	0.8	0.94	0.	0.	0.	2.78
time (sec)	N/A	0.251	0.182	0.046	0.	0.	0.	1.376

Problem 319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	117	91	92	0	0	0	232
normalized size	1	0.97	0.75	0.76	0.	0.	0.	1.92
time (sec)	N/A	0.262	0.207	0.041	0.	0.	0.	1.4

Problem 320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	62	77	0	0	0	138
normalized size	1	1.	0.76	0.94	0.	0.	0.	1.68
time (sec)	N/A	0.166	0.152	0.041	0.	0.	0.	1.422

Problem 321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	78	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.399	2.864	0.267	0.	0.	0.	0.

Problem 322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	46	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.298	0.859	0.317	0.	0.	0.	0.

Problem 323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.121	5.283	2.18	0.	0.	0.	0.

Problem 324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.12	0.75	3.641	0.	0.	0.	0.

Problem 325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	241	179	184	0	0	0	829
normalized size	1	0.98	0.73	0.75	0.	0.	0.	3.38
time (sec)	N/A	0.499	0.752	0.053	0.	0.	0.	1.39

Problem 326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	165	193	0	0	0	639
normalized size	1	1.	0.8	0.94	0.	0.	0.	3.1
time (sec)	N/A	0.423	0.595	0.05	0.	0.	0.	1.372

Problem 327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	179	136	139	0	0	0	486
normalized size	1	0.98	0.74	0.76	0.	0.	0.	2.66
time (sec)	N/A	0.344	0.494	0.046	0.	0.	0.	1.423

Problem 328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	144	144	121	135	0	0	0	340
normalized size	1	1.	0.84	0.94	0.	0.	0.	2.36
time (sec)	N/A	0.242	0.324	0.043	0.	0.	0.	1.405

Problem 329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	139	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.752	2.916	0.268	0.	0.	0.	0.

Problem 330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	106	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.576	1.151	0.273	0.	0.	0.	0.

Problem 331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.139	5.206	2.187	0.	0.	0.	0.

Problem 332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.14	0.758	3.401	0.	0.	0.	0.

Problem 333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	241	180	185	0	0	0	1007
normalized size	1	0.98	0.73	0.76	0.	0.	0.	4.11
time (sec)	N/A	0.512	1.136	0.054	0.	0.	0.	1.45

Problem 334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	209	251	0	0	0	1022
normalized size	1	1.	0.78	0.94	0.	0.	0.	3.81
time (sec)	N/A	0.53	1.03	0.055	0.	0.	0.	1.392

Problem 335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	241	180	185	0	0	0	829
normalized size	1	0.98	0.73	0.76	0.	0.	0.	3.38
time (sec)	N/A	0.447	0.914	0.048	0.	0.	0.	1.424

Problem 336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	165	193	0	0	0	637
normalized size	1	1.	0.8	0.94	0.	0.	0.	3.09
time (sec)	N/A	0.321	0.682	0.044	0.	0.	0.	1.41

Problem 337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	195	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.145	2.93	0.323	0.	0.	0.	0.

Problem 338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	160	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.933	1.065	0.335	0.	0.	0.	0.

Problem 339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.143	5.226	2.24	0.	0.	0.	0.

Problem 340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.145	0.848	3.553	0.	0.	0.	0.

Problem 341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	31	36	0	0	0	47
normalized size	1	1.	0.76	0.88	0.	0.	0.	1.15
time (sec)	N/A	0.159	0.072	0.055	0.	0.	0.	1.315

Problem 342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	24	21	0	0	0	31
normalized size	1	1.	0.89	0.78	0.	0.	0.	1.15
time (sec)	N/A	0.145	0.06	0.049	0.	0.	0.	1.357

Problem 343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	22	24	0	0	0	31
normalized size	1	1.	0.81	0.89	0.	0.	0.	1.15
time (sec)	N/A	0.136	0.058	0.043	0.	0.	0.	1.315

Problem 344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	22	24	0	0	0	31
normalized size	1	1.	0.81	0.89	0.	0.	0.	1.15
time (sec)	N/A	0.135	0.014	0.	0.	0.	0.	1.316

Problem 345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	9	9	9	10	0	0	0	12
normalized size	1	1.	1.	1.11	0.	0.	0.	1.33
time (sec)	N/A	0.075	0.048	0.037	0.	0.	0.	1.374

Problem 346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	9	9	9	10	12	28	7	14
normalized size	1	1.	1.	1.11	1.33	3.11	0.78	1.56
time (sec)	N/A	0.033	0.019	0.003	1.876	1.851	0.496	1.291

Problem 347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.089	1.181	0.092	0.	0.	0.	0.

Problem 348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.092	0.108	0.134	0.	0.	0.	0.

Problem 349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	179	136	139	0	0	0	486
normalized size	1	0.98	0.74	0.76	0.	0.	0.	2.66
time (sec)	N/A	0.373	0.319	0.048	0.	0.	0.	1.432

Problem 350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	108	135	0	0	0	343
normalized size	1	1.	0.75	0.94	0.	0.	0.	2.38
time (sec)	N/A	0.331	0.235	0.046	0.	0.	0.	1.388

Problem 351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	117	92	93	0	0	0	232
normalized size	1	0.97	0.76	0.77	0.	0.	0.	1.92
time (sec)	N/A	0.31	0.196	0.043	0.	0.	0.	1.411

Problem 352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	64	77	0	0	0	140
normalized size	1	1.	0.78	0.94	0.	0.	0.	1.71
time (sec)	N/A	0.25	0.158	0.043	0.	0.	0.	1.317

Problem 353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	50	45	46	0	0	0	68
normalized size	1	0.93	0.83	0.85	0.	0.	0.	1.26
time (sec)	N/A	0.154	0.105	0.039	0.	0.	0.	1.426

Problem 354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F(-2)	C
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	22	42	0	43
normalized size	1	1.	1.	1.06	1.38	2.62	0.	2.69
time (sec)	N/A	0.048	0.048	0.006	1.506	1.936	0.	1.337

Problem 355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.124	2.651	0.117	0.	0.	0.	0.

Problem 356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.128	0.069	0.085	0.	0.	0.	0.

Problem 357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.142	3.714	0.281	0.	0.	0.	0.

Problem 358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.101	9.683	0.202	0.	0.	0.	0.

Problem 359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.047	0.094	0.142	0.	0.	0.	0.

Problem 360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.134	2.559	1.931	0.	0.	0.	0.

Problem 361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.136	1.882	0.385	0.	0.	0.	0.

Problem 362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.14	4.276	1.955	0.	0.	0.	0.

Problem 363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.092	24.043	1.76	0.	0.	0.	0.

Problem 364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.047	0.102	1.447	0.	0.	0.	0.

Problem 365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.135	5.639	4.153	0.	0.	0.	0.

Problem 366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.136	5.745	4.325	0.	0.	0.	0.

Problem 367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.128	0.904	0.967	0.	0.	0.	0.

Problem 368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.127	0.484	0.854	0.	0.	0.	0.

Problem 369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.113	0.065	0.664	0.	0.	0.	0.

Problem 370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.12	0.562	0.2	0.	0.	0.	0.

Problem 371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.14	1.065	0.435	0.	0.	0.	0.

Problem 372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.132	1.615	0.551	0.	0.	0.	0.

Problem 373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.09	0.384	0.2	0.	0.	0.	0.

Problem 374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	83	105	0	0	0	128
normalized size	1	1.	0.87	1.11	0.	0.	0.	1.35
time (sec)	N/A	0.174	0.58	0.05	0.	0.	0.	1.403

Problem 375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	70	83	0	0	0	109
normalized size	1	1.	0.9	1.06	0.	0.	0.	1.4
time (sec)	N/A	0.161	0.487	0.034	0.	0.	0.	1.44

Problem 376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	55	59	0	0	0	66
normalized size	1	1.	1.	1.07	0.	0.	0.	1.2
time (sec)	N/A	0.118	0.222	0.032	0.	0.	0.	1.384

Problem 377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	58	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.096	3.763	0.102	0.	0.	0.	0.

Problem 378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	59	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.097	14.533	0.289	0.	0.	0.	0.

Problem 379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	17	0	50	51	0	0
normalized size	1	1.	1.	0.	2.94	3.	0.	0.
time (sec)	N/A	0.125	0.15	1.068	3.109	1.677	0.	0.

Problem 380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.114	0.503	0.668	0.	0.	0.	0.

Problem 381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	210	175	340	0	0	0	1686
normalized size	1	0.98	0.82	1.59	0.	0.	0.	7.88
time (sec)	N/A	0.633	0.544	0.056	0.	0.	0.	1.703

Problem 382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	82	136	0	0	0	760
normalized size	1	1.	0.87	1.45	0.	0.	0.	8.09
time (sec)	N/A	0.468	0.322	0.046	0.	0.	0.	1.53

Problem 383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	198	125	223	0	0	0	821
normalized size	1	1.32	0.83	1.49	0.	0.	0.	5.47
time (sec)	N/A	0.37	0.283	0.049	0.	0.	0.	1.517

Problem 384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	72	134	0	0	0	392
normalized size	1	1.	0.84	1.56	0.	0.	0.	4.56
time (sec)	N/A	0.162	0.198	0.046	0.	0.	0.	1.555

Problem 385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	104	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.204	10.226	0.532	0.	0.	0.	0.

Problem 386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	56	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.149	2.323	0.43	0.	0.	0.	0.

Problem 387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.121	15.611	3.499	0.	0.	0.	0.

Problem 388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.121	3.445	5.385	0.	0.	0.	0.

Problem 389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.135	0.536	0.869	0.	0.	0.	0.

Problem 390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	278	274	399	455	0	0	0	2788
normalized size	1	0.99	1.44	1.64	0.	0.	0.	10.03
time (sec)	N/A	0.89	1.054	0.061	0.	0.	0.	1.744

Problem 391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	306	364	0	0	0	2097
normalized size	1	1.	1.39	1.65	0.	0.	0.	9.53
time (sec)	N/A	0.636	0.809	0.058	0.	0.	0.	1.702

Problem 392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	210	295	341	0	0	0	1640
normalized size	1	0.98	1.38	1.59	0.	0.	0.	7.66
time (sec)	N/A	0.666	0.517	0.051	0.	0.	0.	1.709

Problem 393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	122	250	0	0	0	1008
normalized size	1	1.	0.81	1.67	0.	0.	0.	6.72
time (sec)	N/A	0.273	0.624	0.048	0.	0.	0.	1.651

Problem 394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	176	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.404	10.335	0.343	0.	0.	0.	0.

Problem 395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.246	4.342	0.341	0.	0.	0.	0.

Problem 396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.14	15.925	0.921	0.	0.	0.	0.

Problem 397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	68	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.197	2.626	4.744	0.	0.	0.	0.

Problem 398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.137	0.562	0.935	0.	0.	0.	0.

Problem 399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	278	274	408	455	0	0	0	3347
normalized size	1	0.99	1.47	1.64	0.	0.	0.	12.04
time (sec)	N/A	1.155	1.508	0.06	0.	0.	0.	1.774

Problem 400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	282	282	414	478	0	0	0	3322
normalized size	1	1.	1.47	1.7	0.	0.	0.	11.78
time (sec)	N/A	0.933	1.082	0.061	0.	0.	0.	1.818

Problem 401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	276	272	404	455	0	0	0	2735
normalized size	1	0.99	1.46	1.65	0.	0.	0.	9.91
time (sec)	N/A	0.872	0.945	0.057	0.	0.	0.	1.724

Problem 402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	311	364	0	0	0	1882
normalized size	1	1.	1.43	1.68	0.	0.	0.	8.67
time (sec)	N/A	0.4	0.825	0.054	0.	0.	0.	1.595

Problem 403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	234	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.534	12.721	0.424	0.	0.	0.	0.

Problem 404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	104	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.312	3.44	0.443	0.	0.	0.	0.

Problem 405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.14	15.979	3.508	0.	0.	0.	0.

Problem 406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.138	3.146	5.251	0.	0.	0.	0.

Problem 407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	48	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.162	0.597	0.233	0.	0.	0.	0.

Problem 408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	204	200	157	341	0	0	0	1725
normalized size	1	0.98	0.77	1.67	0.	0.	0.	8.46
time (sec)	N/A	0.441	0.345	0.054	0.	0.	0.	1.649

Problem 409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	117	250	0	0	0	1183
normalized size	1	1.	0.83	1.77	0.	0.	0.	8.39
time (sec)	N/A	0.359	0.301	0.05	0.	0.	0.	1.569

Problem 410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	138	113	227	0	0	0	859
normalized size	1	0.97	0.8	1.6	0.	0.	0.	6.05
time (sec)	N/A	0.34	0.269	0.046	0.	0.	0.	1.552

Problem 411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	70	136	0	0	0	467
normalized size	1	1.	0.89	1.72	0.	0.	0.	5.91
time (sec)	N/A	0.244	0.157	0.047	0.	0.	0.	1.481

Problem 412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	59	108	0	0	0	270
normalized size	1	1.	0.82	1.5	0.	0.	0.	3.75
time (sec)	N/A	0.15	0.107	0.042	0.	0.	0.	1.473

Problem 413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	24	43	0	24
normalized size	1	1.	1.	1.06	1.33	2.39	0.	1.33
time (sec)	N/A	0.044	0.008	0.006	1.493	2.263	0.	1.134

Problem 414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	46	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.152	7.292	0.13	0.	0.	0.	0.

Problem 415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	46	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.149	1.288	0.093	0.	0.	0.	0.

Problem 416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.136	1.117	0.448	0.	0.	0.	0.

Problem 417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.141	59.009	0.482	0.	0.	0.	0.

Problem 418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	68	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.201	7.82	0.327	0.	0.	0.	0.

Problem 419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.093	58.237	0.223	0.	0.	0.	0.

Problem 420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.108	2.569	0.194	0.	0.	0.	0.

Problem 421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.132	46.907	2.224	0.	0.	0.	0.

Problem 422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.132	31.424	0.642	0.	0.	0.	0.

Problem 423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.133	1.631	0.564	0.	0.	0.	0.

Problem 424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.134	100.053	3.177	0.	0.	0.	0.

Problem 425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.136	11.39	2.841	0.	0.	0.	0.

Problem 426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.094	103.175	2.423	0.	0.	0.	0.

Problem 427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.11	4.014	0.462	0.	0.	0.	0.

Problem 428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.131	77.64	6.138	0.	0.	0.	0.

Problem 429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.132	23.673	6.249	0.	0.	0.	0.

Problem 430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	32	12	15
normalized size	1	1.	1.	0.92	1.15	2.46	0.92	1.15
time (sec)	N/A	0.031	0.005	0.01	1.44	2.041	1.158	1.434

Problem 431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	251	251	287	287	0	0	0	0
normalized size	1	1.	1.14	1.14	0.	0.	0.	0.
time (sec)	N/A	1.444	1.41	0.097	0.	0.	0.	0.

Problem 432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	591	591	514	441	0	0	0	0
normalized size	1	1.	0.87	0.75	0.	0.	0.	0.
time (sec)	N/A	1.668	1.541	0.106	0.	0.	0.	0.

Problem 433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	241	241	375	283	0	0	0	0
normalized size	1	1.	1.56	1.17	0.	0.	0.	0.
time (sec)	N/A	0.787	2.224	0.079	0.	0.	0.	0.

Problem 434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	253	253	348	297	0	0	0	0
normalized size	1	1.	1.38	1.17	0.	0.	0.	0.
time (sec)	N/A	0.592	1.096	0.074	0.	0.	0.	0.

Problem 435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	170	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.779	1.836	0.3	0.	0.	0.	0.

Problem 436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	485	485	540	551	0	0	0	0
normalized size	1	1.	1.11	1.14	0.	0.	0.	0.
time (sec)	N/A	1.662	2.745	0.105	0.	0.	0.	0.

Problem 437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	511	511	686	590	0	0	0	0
normalized size	1	1.	1.34	1.15	0.	0.	0.	0.
time (sec)	N/A	2.124	2.756	0.112	0.	0.	0.	0.

Problem 438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	373	373	509	426	0	0	0	0
normalized size	1	1.	1.36	1.14	0.	0.	0.	0.
time (sec)	N/A	1.401	3.07	0.086	0.	0.	0.	0.

Problem 439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	390	390	522	446	0	0	0	0
normalized size	1	1.	1.34	1.14	0.	0.	0.	0.
time (sec)	N/A	0.816	2.401	0.087	0.	0.	0.	0.

Problem 440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	288	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.463	3.508	0.404	0.	0.	0.	0.

Problem 441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	42	42	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.151	3.527	0.218	0.	0.	0.	0.

Problem 442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	227	227	166	0	0	0	0	0
normalized size	1	1.	0.73	0.	0.	0.	0.	0.
time (sec)	N/A	0.283	0.22	0.197	0.	0.	0.	0.

Problem 443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	130	130	138	0	0	0	0	0
normalized size	1	1.	1.06	0.	0.	0.	0.	0.
time (sec)	N/A	0.118	0.067	0.231	0.	0.	0.	0.

Problem 444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0
normalized size	1	1.	1.	0.86	0.	0.	0.	0.
time (sec)	N/A	0.075	0.047	0.039	0.	0.	0.	0.

Problem 445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	90	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.095	0.619	0.235	0.	0.	0.	0.

Problem 446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	185	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.189	1.721	0.296	0.	0.	0.	0.

Problem 447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	363	363	186	0	0	0	0	0
normalized size	1	1.	0.51	0.	0.	0.	0.	0.
time (sec)	N/A	0.434	0.425	0.179	0.	0.	0.	0.

Problem 448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	219	219	158	0	0	0	0	0
normalized size	1	1.	0.72	0.	0.	0.	0.	0.
time (sec)	N/A	0.225	0.108	0.234	0.	0.	0.	0.

Problem 449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0
normalized size	1	1.	1.	0.86	0.	0.	0.	0.
time (sec)	N/A	0.072	0.056	0.037	0.	0.	0.	0.

Problem 450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	90	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.088	0.7	0.208	0.	0.	0.	0.

Problem 451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	431	431	180	0	0	0	0	0
normalized size	1	1.	0.42	0.	0.	0.	0.	0.
time (sec)	N/A	0.578	0.317	0.18	0.	0.	0.	0.

Problem 452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	247	247	158	0	0	0	0	0
normalized size	1	1.	0.64	0.	0.	0.	0.	0.
time (sec)	N/A	0.249	0.123	0.234	0.	0.	0.	0.

Problem 453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0
normalized size	1	1.	1.	0.86	0.	0.	0.	0.
time (sec)	N/A	0.069	0.053	0.038	0.	0.	0.	0.

Problem 454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	90	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.085	0.676	0.238	0.	0.	0.	0.

Problem 455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	226	226	183	0	0	0	0	0
normalized size	1	1.	0.81	0.	0.	0.	0.	0.
time (sec)	N/A	0.237	0.201	0.256	0.	0.	0.	0.

Problem 456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	126	126	148	0	0	0	0	0
normalized size	1	1.	1.17	0.	0.	0.	0.	0.
time (sec)	N/A	0.106	0.072	0.267	0.	0.	0.	0.

Problem 457	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	90	0	20
normalized size	1	1.	1.	0.9	0.	2.14	0.	0.48
time (sec)	N/A	0.061	0.032	0.043	0.	2.279	0.	1.225

Problem 458	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	89	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.075	0.573	0.227	0.	0.	0.	0.

Problem 459	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	183	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.156	1.758	0.273	0.	0.	0.	0.

Problem 460	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	359	359	209	0	0	0	0	0
normalized size	1	1.	0.58	0.	0.	0.	0.	0.
time (sec)	N/A	0.421	0.435	0.184	0.	0.	0.	0.

Problem 461	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	215	215	173	0	0	0	0	0
normalized size	1	1.	0.8	0.	0.	0.	0.	0.
time (sec)	N/A	0.232	0.136	0.236	0.	0.	0.	0.

Problem 462	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	92	0	16
normalized size	1	1.	1.	0.9	0.	2.19	0.	0.38
time (sec)	N/A	0.065	0.036	0.038	0.	2.305	0.	1.407

Problem 463	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	89	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.075	0.658	0.188	0.	0.	0.	0.

Problem 464	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F(-2)	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	25	25	53	20	0	0	0	50
normalized size	1	1.	2.12	0.8	0.	0.	0.	2.
time (sec)	N/A	0.061	0.076	0.067	0.	0.	0.	1.356

Problem 465	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	244	244	336	0	0	0	0	0
normalized size	1	1.	1.38	0.	0.	0.	0.	0.
time (sec)	N/A	0.193	0.629	0.182	0.	0.	0.	0.

Problem 466	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	170	170	182	0	0	0	0	0
normalized size	1	1.	1.07	0.	0.	0.	0.	0.
time (sec)	N/A	0.154	0.305	0.181	0.	0.	0.	0.

Problem 467	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	99	99	118	0	0	0	0	0
normalized size	1	1.	1.19	0.	0.	0.	0.	0.
time (sec)	N/A	0.122	0.129	0.235	0.	0.	0.	0.

Problem 468	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	0	0	0
normalized size	1	1.	1.	0.9	0.	0.	0.	0.
time (sec)	N/A	0.07	0.047	0.034	0.	0.	0.	0.

Problem 469	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.041	0.852	0.207	0.	0.	0.	0.

Problem 470	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.04	2.036	0.284	0.	0.	0.	0.

Problem 471	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	237	237	404	0	0	0	0	0
normalized size	1	1.	1.7	0.	0.	0.	0.	0.
time (sec)	N/A	0.186	1.056	0.178	0.	0.	0.	0.

Problem 472	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	163	163	211	0	0	0	0	0
normalized size	1	1.	1.29	0.	0.	0.	0.	0.
time (sec)	N/A	0.134	0.376	0.177	0.	0.	0.	0.

Problem 473	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	83	0	0	0	0	0
normalized size	1	1.	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.08	0.17	0.234	0.	0.	0.	0.

Problem 474	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	109	0	0
normalized size	1	1.	1.	0.9	0.	2.6	0.	0.
time (sec)	N/A	0.07	0.044	0.036	0.	2.152	0.	0.

Problem 475	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	102	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.092	0.841	0.211	0.	0.	0.	0.

Problem 476	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	102	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.094	1.878	0.291	0.	0.	0.	0.

Problem 477	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	206	206	251	0	0	0	0	0
normalized size	1	1.	1.22	0.	0.	0.	0.	0.
time (sec)	N/A	0.297	1.333	0.183	0.	0.	0.	0.

Problem 478	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	130	130	142	0	0	0	0	0
normalized size	1	1.	1.09	0.	0.	0.	0.	0.
time (sec)	N/A	0.073	0.47	0.236	0.	0.	0.	0.

Problem 479	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	112	0	0
normalized size	1	1.	1.	0.86	0.	2.55	0.	0.
time (sec)	N/A	0.069	0.053	0.036	0.	1.951	0.	0.

Problem 480	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	106	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.087	0.838	0.206	0.	0.	0.	0.

Problem 481	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	106	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.089	1.929	0.293	0.	0.	0.	0.

Problem 482	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	259	259	189	0	0	0	0	0
normalized size	1	1.	0.73	0.	0.	0.	0.	0.
time (sec)	N/A	0.456	0.833	0.36	0.	0.	0.	0.

Problem 483	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	391	391	272	0	0	0	0	0
normalized size	1	1.	0.7	0.	0.	0.	0.	0.
time (sec)	N/A	0.44	0.841	0.225	0.	0.	0.	0.

Problem 484	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	259	259	182	0	0	0	0	0
normalized size	1	1.	0.7	0.	0.	0.	0.	0.
time (sec)	N/A	0.293	0.753	0.21	0.	0.	0.	0.

Problem 485	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	218	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.138	0.192	0.434	0.	0.	0.	0.

Problem 486	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	87	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.142	0.257	0.217	0.	0.	0.	0.

Problem 487	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	684	684	436	0	0	0	0	0
normalized size	1	1.	0.64	0.	0.	0.	0.	0.
time (sec)	N/A	0.81	3.21	0.267	0.	0.	0.	0.

Problem 488	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	595	595	464	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.586	2.092	0.171	0.	0.	0.	0.

Problem 489	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	466	466	326	0	0	0	0	0
normalized size	1	1.	0.7	0.	0.	0.	0.	0.
time (sec)	N/A	0.407	1.66	0.133	0.	0.	0.	0.

Problem 490	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	426	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.159	0.205	0.162	0.	0.	0.	0.

Problem 491	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	297	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.158	0.715	0.196	0.	0.	0.	0.

Problem 492	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	906	906	989	0	0	0	0	0
normalized size	1	1.	1.09	0.	0.	0.	0.	0.
time (sec)	N/A	0.96	4.218	0.259	0.	0.	0.	0.

Problem 493	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	815	815	603	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.735	3.974	0.174	0.	0.	0.	0.

Problem 494	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	698	698	477	0	0	0	0	0
normalized size	1	1.	0.68	0.	0.	0.	0.	0.
time (sec)	N/A	0.577	4.335	0.13	0.	0.	0.	0.

Problem 495	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	826	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.155	0.225	0.161	0.	0.	0.	0.

Problem 496	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	501	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.16	0.722	0.19	0.	0.	0.	0.

Problem 497	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.102	0.477	0.355	0.	0.	0.	0.

Problem 498	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	153	0	0	0	0	0
normalized size	1	1.	0.94	0.	0.	0.	0.	0.
time (sec)	N/A	0.246	0.32	0.248	0.	0.	0.	0.

Problem 499	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	109	0	0	0	0	0
normalized size	1	1.	1.	0.	0.	0.	0.	0.
time (sec)	N/A	0.207	0.254	0.217	0.	0.	0.	0.

Problem 500	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	70	0	0	0	0	0
normalized size	1	1.	0.93	0.	0.	0.	0.	0.
time (sec)	N/A	0.116	0.074	0.097	0.	0.	0.	0.

Problem 501	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	0	50	34	23
normalized size	1	1.	1.	1.06	0.	2.94	2.	1.35
time (sec)	N/A	0.036	0.007	0.003	0.	2.087	1.039	1.235

Problem 502	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.102	3.219	0.099	0.	0.	0.	0.

Problem 503	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.102	0.936	0.127	0.	0.	0.	0.

Problem 504	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	376	376	293	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.537	1.234	0.338	0.	0.	0.	0.

Problem 505	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	273	273	260	0	0	0	0	0
normalized size	1	1.	0.95	0.	0.	0.	0.	0.
time (sec)	N/A	0.297	0.944	0.232	0.	0.	0.	0.

Problem 506	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	158	0	0	0	0	0
normalized size	1	1.	1.18	0.	0.	0.	0.	0.
time (sec)	N/A	0.165	0.933	0.237	0.	0.	0.	0.

Problem 507	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	200	0	0	0	0	0
normalized size	1	1.	1.42	0.	0.	0.	0.	0.
time (sec)	N/A	0.264	0.785	0.243	0.	0.	0.	0.

Problem 508	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	162	248	0	0	0	0	0
normalized size	1	1.	1.53	0.	0.	0.	0.	0.
time (sec)	N/A	0.36	1.325	0.285	0.	0.	0.	0.

Problem 509	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	114	0	0	1137	0	0
normalized size	1	1.	0.7	0.	0.	6.98	0.	0.
time (sec)	N/A	0.269	0.483	0.239	0.	2.817	0.	0.

Problem 510	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	414	414	305	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.39	1.523	0.224	0.	0.	0.	0.

Problem 511	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	226	226	247	0	0	0	0	0
normalized size	1	1.	1.09	0.	0.	0.	0.	0.
time (sec)	N/A	0.224	1.044	0.224	0.	0.	0.	0.

Problem 512	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	273	273	260	0	0	0	0	0
normalized size	1	1.	0.95	0.	0.	0.	0.	0.
time (sec)	N/A	0.312	1.003	0.236	0.	0.	0.	0.

Problem 513	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	242	242	238	0	0	0	0	0
normalized size	1	1.	0.98	0.	0.	0.	0.	0.
time (sec)	N/A	0.425	1.224	0.23	0.	0.	0.	0.

Problem 514	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	252	252	291	0	0	0	0	0
normalized size	1	1.	1.15	0.	0.	0.	0.	0.
time (sec)	N/A	0.436	3.157	0.238	0.	0.	0.	0.

Problem 515	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	324	324	599	0	0	0	0	0
normalized size	1	1.	1.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.353	5.101	0.233	0.	0.	0.	0.

Problem 516	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	315	315	303	0	0	0	0	0
normalized size	1	1.	0.96	0.	0.	0.	0.	0.
time (sec)	N/A	0.265	1.513	0.226	0.	0.	0.	0.

Problem 517	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	414	414	305	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.382	1.455	0.224	0.	0.	0.	0.

Problem 518	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	376	376	293	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.539	1.203	0.235	0.	0.	0.	0.

Problem 519	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	345	345	274	0	0	0	0	0
normalized size	1	1.	0.79	0.	0.	0.	0.	0.
time (sec)	N/A	0.592	1.734	0.23	0.	0.	0.	0.

Problem 520	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	465	465	685	0	0	0	0	0
normalized size	1	1.	1.47	0.	0.	0.	0.	0.
time (sec)	N/A	0.375	3.562	0.247	0.	0.	0.	0.

Problem 521	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	420	420	847	0	0	0	0	0
normalized size	1	1.	2.02	0.	0.	0.	0.	0.
time (sec)	N/A	0.394	6.721	0.242	0.	0.	0.	0.

Problem 522	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	345	345	270	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.587	2.079	0.233	0.	0.	0.	0.

Problem 523	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	242	242	238	0	0	0	0	0
normalized size	1	1.	0.98	0.	0.	0.	0.	0.
time (sec)	N/A	0.42	1.124	0.23	0.	0.	0.	0.

Problem 524	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	200	0	0	0	0	0
normalized size	1	1.	1.42	0.	0.	0.	0.	0.
time (sec)	N/A	0.258	0.705	0.243	0.	0.	0.	0.

Problem 525	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	110	0	0	0	0	0
normalized size	1	1.	2.	0.	0.	0.	0.	0.
time (sec)	N/A	0.144	0.498	0.21	0.	0.	0.	0.

Problem 526	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	99	99	79	0	0	803	0	0
normalized size	1	1.	0.8	0.	0.	8.11	0.	0.
time (sec)	N/A	0.213	0.364	0.231	0.	2.599	0.	0.

Problem 527	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	265	265	118	0	0	1157	0	0
normalized size	1	1.	0.45	0.	0.	4.37	0.	0.
time (sec)	N/A	0.3	0.454	0.235	0.	3.114	0.	0.

Problem 528	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	463	463	768	0	0	0	0	0
normalized size	1	1.	1.66	0.	0.	0.	0.	0.
time (sec)	N/A	0.37	3.995	0.245	0.	0.	0.	0.

Problem 529	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	252	252	514	0	0	0	0	0
normalized size	1	1.	2.04	0.	0.	0.	0.	0.
time (sec)	N/A	0.422	2.668	0.238	0.	0.	0.	0.

Problem 530	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	162	281	0	0	0	0	0
normalized size	1	1.	1.73	0.	0.	0.	0.	0.
time (sec)	N/A	0.347	1.502	0.263	0.	0.	0.	0.

Problem 531	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	106	0	0	803	0	0
normalized size	1	1.	1.08	0.	0.	8.19	0.	0.
time (sec)	N/A	0.21	0.429	0.231	0.	2.505	0.	0.

Problem 532	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	96	96	105	0	117	0	0	0
normalized size	1	1.	1.09	0.	1.22	0.	0.	0.
time (sec)	N/A	0.175	0.454	0.227	1.522	0.	0.	0.

Problem 533	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	255	255	180	0	0	0	0	0
normalized size	1	1.	0.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.262	0.598	0.227	0.	0.	0.	0.

Problem 534	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	419	419	850	0	0	0	0	0
normalized size	1	1.	2.03	0.	0.	0.	0.	0.
time (sec)	N/A	0.38	5.793	0.247	0.	0.	0.	0.

Problem 535	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	324	324	601	0	0	0	0	0
normalized size	1	1.	1.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.341	4.432	0.232	0.	0.	0.	0.

Problem 536	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	126	0	0	1137	0	0
normalized size	1	1.	0.77	0.	0.	6.93	0.	0.
time (sec)	N/A	0.256	0.487	0.242	0.	3.246	0.	0.

Problem 537	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	265	265	130	0	0	1157	0	0
normalized size	1	1.	0.49	0.	0.	4.37	0.	0.
time (sec)	N/A	0.286	0.462	0.229	0.	3.435	0.	0.

Problem 538	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	255	255	184	0	0	0	0	0
normalized size	1	1.	0.72	0.	0.	0.	0.	0.
time (sec)	N/A	0.252	0.624	0.23	0.	0.	0.	0.

Problem 539	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	178	0	239	0	0	0
normalized size	1	1.	0.95	0.	1.27	0.	0.	0.
time (sec)	N/A	0.202	0.582	0.228	1.54	0.	0.	0.

Problem 540	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	613	613	555	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	1.01	2.291	0.311	0.	0.	0.	0.

Problem 541	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	455	455	437	0	0	0	0	0
normalized size	1	1.	0.96	0.	0.	0.	0.	0.
time (sec)	N/A	0.571	1.786	0.262	0.	0.	0.	0.

Problem 542	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	222	222	288	0	0	0	0	0
normalized size	1	1.	1.3	0.	0.	0.	0.	0.
time (sec)	N/A	0.299	1.013	0.266	0.	0.	0.	0.

Problem 543	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	230	230	296	0	0	0	0	0
normalized size	1	1.	1.29	0.	0.	0.	0.	0.
time (sec)	N/A	0.441	1.148	0.271	0.	0.	0.	0.

Problem 544	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	530	530	547	0	0	0	0	0
normalized size	1	1.	1.03	0.	0.	0.	0.	0.
time (sec)	N/A	0.948	3.712	0.214	0.	0.	0.	0.

Problem 545	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	486	486	694	0	0	0	0	0
normalized size	1	1.	1.43	0.	0.	0.	0.	0.
time (sec)	N/A	1.119	7.947	0.267	0.	0.	0.	0.

Problem 546	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	697	697	574	0	0	0	0	0
normalized size	1	1.	0.82	0.	0.	0.	0.	0.
time (sec)	N/A	0.8	3.525	0.256	0.	0.	0.	0.

Problem 547	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	362	362	373	0	0	0	0	0
normalized size	1	1.	1.03	0.	0.	0.	0.	0.
time (sec)	N/A	0.431	1.839	0.25	0.	0.	0.	0.

Problem 548	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	455	455	440	0	0	0	0	0
normalized size	1	1.	0.97	0.	0.	0.	0.	0.
time (sec)	N/A	0.592	1.808	0.267	0.	0.	0.	0.

Problem 549	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	398	398	358	0	0	0	0	0
normalized size	1	1.	0.9	0.	0.	0.	0.	0.
time (sec)	N/A	0.578	2.237	0.262	0.	0.	0.	0.

Problem 550	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	714	714	1086	0	0	0	0	0
normalized size	1	1.	1.52	0.	0.	0.	0.	0.
time (sec)	N/A	1.085	7.328	0.201	0.	0.	0.	0.

Problem 551	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	544	544	1430	0	0	0	0	0
normalized size	1	1.	2.63	0.	0.	0.	0.	0.
time (sec)	N/A	1.154	9.594	0.204	0.	0.	0.	0.

Problem 552	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	502	502	450	0	0	0	0	0
normalized size	1	1.	0.9	0.	0.	0.	0.	0.
time (sec)	N/A	0.568	2.836	0.256	0.	0.	0.	0.

Problem 553	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	697	697	574	0	0	0	0	0
normalized size	1	1.	0.82	0.	0.	0.	0.	0.
time (sec)	N/A	0.794	3.667	0.259	0.	0.	0.	0.

Problem 554	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	613	613	555	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	1.003	2.329	0.275	0.	0.	0.	0.

Problem 555	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	559	559	473	0	0	0	0	0
normalized size	1	1.	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.688	3.263	0.266	0.	0.	0.	0.

Problem 556	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	918	918	2279	0	0	0	0	0
normalized size	1	1.	2.48	0.	0.	0.	0.	0.
time (sec)	N/A	1.273	10.767	0.217	0.	0.	0.	0.

Problem 557	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	729	729	2326	0	0	0	0	0
normalized size	1	1.	3.19	0.	0.	0.	0.	0.
time (sec)	N/A	1.303	12.45	0.204	0.	0.	0.	0.

Problem 558	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	559	559	434	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.66	3.562	0.263	0.	0.	0.	0.

Problem 559	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	398	398	344	0	0	0	0	0
normalized size	1	1.	0.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.562	2.159	0.265	0.	0.	0.	0.

Problem 560	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	231	231	298	0	0	0	0	0
normalized size	1	1.	1.29	0.	0.	0.	0.	0.
time (sec)	N/A	0.442	1.127	0.273	0.	0.	0.	0.

Problem 561	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	159	0	0	0	0	0
normalized size	1	1.	2.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.238	0.921	0.24	0.	0.	0.	0.

Problem 562	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	455	455	225	0	0	0	0	0
normalized size	1	1.	0.49	0.	0.	0.	0.	0.
time (sec)	N/A	0.672	1.726	0.267	0.	0.	0.	0.

Problem 563	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	896	896	536	0	0	0	0	0
normalized size	1	1.	0.6	0.	0.	0.	0.	0.
time (sec)	N/A	1.239	7.394	0.263	0.	0.	0.	0.

Problem 564	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	918	918	2029	0	0	0	0	0
normalized size	1	1.	2.21	0.	0.	0.	0.	0.
time (sec)	N/A	1.275	13.589	0.207	0.	0.	0.	0.

Problem 565	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	713	713	1247	0	0	0	0	0
normalized size	1	1.	1.75	0.	0.	0.	0.	0.
time (sec)	N/A	1.049	10.44	0.202	0.	0.	0.	0.

Problem 566	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	530	530	513	0	0	0	0	0
normalized size	1	1.	0.97	0.	0.	0.	0.	0.
time (sec)	N/A	0.909	5.926	0.217	0.	0.	0.	0.

Problem 567	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	454	454	221	0	0	0	0	0
normalized size	1	1.	0.49	0.	0.	0.	0.	0.
time (sec)	N/A	0.659	1.689	0.26	0.	0.	0.	0.

Problem 568	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-1)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	550	0	0	0	0	0
normalized size	1	1.	2.53	0.	0.	0.	0.	0.
time (sec)	N/A	0.377	1.336	0.253	0.	0.	0.	0.

Problem 569	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	709	709	735	0	0	0	0	0
normalized size	1	1.	1.04	0.	0.	0.	0.	0.
time (sec)	N/A	0.839	8.233	0.257	0.	0.	0.	0.

Problem 570	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	730	730	2300	0	0	0	0	0
normalized size	1	1.	3.15	0.	0.	0.	0.	0.
time (sec)	N/A	1.291	12.896	0.202	0.	0.	0.	0.

Problem 571	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	544	544	1411	0	0	0	0	0
normalized size	1	1.	2.59	0.	0.	0.	0.	0.
time (sec)	N/A	1.145	9.92	0.206	0.	0.	0.	0.

Problem 572	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	486	486	683	0	0	0	0	0
normalized size	1	1.	1.41	0.	0.	0.	0.	0.
time (sec)	N/A	1.07	8.236	0.273	0.	0.	0.	0.

Problem 573	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	896	896	388	0	0	0	0	0
normalized size	1	1.	0.43	0.	0.	0.	0.	0.
time (sec)	N/A	1.231	6.602	0.257	0.	0.	0.	0.

Problem 574	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	709	709	760	0	0	0	0	0
normalized size	1	1.	1.07	0.	0.	0.	0.	0.
time (sec)	N/A	0.836	8.29	0.257	0.	0.	0.	0.

Problem 575	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-1)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	366	366	722	0	0	0	0	0
normalized size	1	1.	1.97	0.	0.	0.	0.	0.
time (sec)	N/A	0.474	9.408	0.259	0.	0.	0.	0.

Problem 576	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	351	351	297	0	0	0	0	0
normalized size	1	1.	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.705	1.139	0.648	0.	0.	0.	0.

Problem 577	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	178	0	0	435	0	610
normalized size	1	1.	0.79	0.	0.	1.93	0.	2.71
time (sec)	N/A	0.395	0.585	0.361	0.	2.448	0.	1.6

Problem 578	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	222	222	288	0	0	0	0	0
normalized size	1	1.	1.3	0.	0.	0.	0.	0.
time (sec)	N/A	0.29	1.099	0.	0.	0.	0.	0.

Problem 579	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	432	432	434	0	0	0	0	0
normalized size	1	1.	1.	0.	0.	0.	0.	0.
time (sec)	N/A	0.681	2.292	0.296	0.	0.	0.	0.

Problem 580	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	257	257	373	0	0	0	0	0
normalized size	1	1.	1.45	0.	0.	0.	0.	0.
time (sec)	N/A	0.594	1.188	0.431	0.	0.	0.	0.

Problem 581	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	509	509	452	0	0	0	0	0
normalized size	1	1.	0.89	0.	0.	0.	0.	0.
time (sec)	N/A	1.026	2.157	0.616	0.	0.	0.	0.

Problem 582	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	338	338	207	0	0	691	0	1897
normalized size	1	1.	0.61	0.	0.	2.04	0.	5.61
time (sec)	N/A	0.507	0.816	0.35	0.	2.533	0.	2.153

Problem 583	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	362	362	373	0	0	0	0	0
normalized size	1	1.	1.03	0.	0.	0.	0.	0.
time (sec)	N/A	0.422	1.631	0.	0.	0.	0.	0.

Problem 584	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	647	647	632	0	0	0	0	0
normalized size	1	1.	0.98	0.	0.	0.	0.	0.
time (sec)	N/A	0.941	4.943	0.279	0.	0.	0.	0.

Problem 585	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	505	505	538	0	0	0	0	0
normalized size	1	1.	1.07	0.	0.	0.	0.	0.
time (sec)	N/A	0.807	2.266	0.419	0.	0.	0.	0.

Problem 586	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	250	250	326	0	0	0	0	0
normalized size	1	1.	1.3	0.	0.	0.	0.	0.
time (sec)	N/A	0.582	1.302	0.331	0.	0.	0.	0.

Problem 587	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	150	0	0	302	0	0
normalized size	1	1.	0.85	0.	0.	1.71	0.	0.
time (sec)	N/A	0.377	0.66	0.365	0.	2.332	0.	0.

Problem 588	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	159	0	0	0	0	0
normalized size	1	1.	2.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.232	0.647	0.	0.	0.	0.	0.

Problem 589	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	287	287	336	0	0	0	0	0
normalized size	1	1.	1.17	0.	0.	0.	0.	0.
time (sec)	N/A	0.58	1.503	0.289	0.	0.	0.	0.

Problem 590	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	214	214	189	0	0	0	0	0
normalized size	1	1.	0.88	0.	0.	0.	0.	0.
time (sec)	N/A	0.584	1.12	0.526	0.	0.	0.	0.

Problem 591	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	295	295	636	0	0	0	0	0
normalized size	1	1.	2.16	0.	0.	0.	0.	0.
time (sec)	N/A	0.743	2.53	0.338	0.	0.	0.	0.

Problem 592	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	244	244	453	0	0	0	0	0
normalized size	1	1.	1.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.488	1.347	0.38	0.	0.	0.	0.

Problem 593	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F(-1)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	550	0	0	0	0	0
normalized size	1	1.	2.53	0.	0.	0.	0.	0.
time (sec)	N/A	0.383	0.776	0.	0.	0.	0.	0.

Problem 594	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	548	548	877	0	0	0	0	0
normalized size	1	1.	1.6	0.	0.	0.	0.	0.
time (sec)	N/A	0.853	5.747	0.284	0.	0.	0.	0.

Problem 595	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	396	396	564	0	0	0	0	0
normalized size	1	1.	1.42	0.	0.	0.	0.	0.
time (sec)	N/A	0.858	2.476	0.49	0.	0.	0.	0.

Problem 596	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	115	201	247	308	223	439
normalized size	1	1.	0.76	1.32	1.62	2.03	1.47	2.89
time (sec)	N/A	0.15	0.114	0.005	1.463	2.278	7.818	1.216

Problem 597	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	116	177	252	286	206	454
normalized size	1	1.	0.78	1.19	1.69	1.92	1.38	3.05
time (sec)	N/A	0.117	0.082	0.006	1.475	2.345	5.268	1.268

Problem 598	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	96	161	192	250	172	293
normalized size	1	1.	0.8	1.34	1.6	2.08	1.43	2.44
time (sec)	N/A	0.127	0.091	0.004	1.447	2.387	2.593	1.324

Problem 599	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	95	137	197	234	153	273
normalized size	1	1.	0.78	1.12	1.61	1.92	1.25	2.24
time (sec)	N/A	0.088	0.064	0.005	1.449	2.347	1.395	1.272

Problem 600	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	71	111	123	186	109	154
normalized size	1	1.	0.88	1.37	1.52	2.3	1.35	1.9
time (sec)	N/A	0.065	0.065	0.003	1.442	2.498	0.689	1.232

Problem 601	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	132	132	108	177	0	0	0	0
normalized size	1	1.	0.82	1.34	0.	0.	0.	0.
time (sec)	N/A	0.239	0.2	0.205	0.	0.	0.	0.

Problem 602	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	71	79	107	244	75	1399
normalized size	1	1.	1.08	1.2	1.62	3.7	1.14	21.2
time (sec)	N/A	0.077	0.055	0.008	1.437	3.09	4.115	1.753

Problem 603	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	104	174	0	0	0	0
normalized size	1	1.	0.87	1.46	0.	0.	0.	0.
time (sec)	N/A	0.223	0.11	0.287	0.	0.	0.	0.

Problem 604	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	109	120	161	277	170	581
normalized size	1	1.	1.28	1.41	1.89	3.26	2.	6.84
time (sec)	N/A	0.087	0.047	0.01	1.439	2.457	5.272	13.46

Problem 605	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	241	241	187	339	424	540	415	805
normalized size	1	1.	0.78	1.41	1.76	2.24	1.72	3.34
time (sec)	N/A	0.318	0.205	0.005	1.475	2.083	23.995	1.261

Problem 606	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	241	241	190	303	432	517	382	861
normalized size	1	1.	0.79	1.26	1.79	2.15	1.59	3.57
time (sec)	N/A	0.251	0.163	0.007	1.475	2.145	15.678	1.25

Problem 607	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	198	198	158	279	342	450	333	576
normalized size	1	1.	0.8	1.41	1.73	2.27	1.68	2.91
time (sec)	N/A	0.221	0.184	0.004	1.467	2.041	8.288	1.261

Problem 608	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	159	243	350	414	299	571
normalized size	1	1.	0.87	1.33	1.91	2.26	1.63	3.12
time (sec)	N/A	0.176	0.143	0.004	1.461	2.113	5.862	1.351

Problem 609	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	125	209	246	348	240	355
normalized size	1	1.	0.83	1.39	1.64	2.32	1.6	2.37
time (sec)	N/A	0.136	0.151	0.006	1.457	2.035	2.859	1.25

Problem 610	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	184	272	0	0	0	0
normalized size	1	1.	0.8	1.19	0.	0.	0.	0.
time (sec)	N/A	0.335	0.465	0.208	0.	0.	0.	0.

Problem 611	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	129	168	204	385	167	5733
normalized size	1	1.	1.02	1.33	1.62	3.06	1.33	45.5
time (sec)	N/A	0.184	0.138	0.008	1.462	2.755	5.774	3.077

Problem 612	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	159	248	0	0	0	0
normalized size	1	1.	0.86	1.34	0.	0.	0.	0.
time (sec)	N/A	0.338	0.333	0.371	0.	0.	0.	0.

Problem 613	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	140	156	215	393	219	3429
normalized size	1	1.	1.11	1.24	1.71	3.12	1.74	27.21
time (sec)	N/A	0.201	0.163	0.01	1.451	2.867	7.151	84.875

Problem 614	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	341	341	271	497	628	846	631	1253
normalized size	1	1.	0.79	1.46	1.84	2.48	1.85	3.67
time (sec)	N/A	0.435	0.262	0.016	1.495	2.065	65.626	1.362

Problem 615	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	380	380	276	449	639	776	597	1386
normalized size	1	1.	0.73	1.18	1.68	2.04	1.57	3.65
time (sec)	N/A	0.508	0.242	0.006	1.489	2.211	46.39	1.329

Problem 616	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	287	287	231	417	518	679	525	942
normalized size	1	1.	0.8	1.45	1.8	2.37	1.83	3.28
time (sec)	N/A	0.373	0.226	0.006	1.474	2.063	24.827	1.29

Problem 617	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	258	258	232	369	529	636	483	987
normalized size	1	1.	0.9	1.43	2.05	2.47	1.87	3.83
time (sec)	N/A	0.268	0.2	0.005	1.489	2.158	16.905	1.239

Problem 618	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	187	325	394	537	389	633
normalized size	1	1.	0.83	1.44	1.75	2.39	1.73	2.81
time (sec)	N/A	0.251	0.244	0.005	1.468	2.057	8.864	1.299

Problem 619	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	357	357	278	392	0	0	0	0
normalized size	1	1.	0.78	1.1	0.	0.	0.	0.
time (sec)	N/A	0.476	0.371	0.342	0.	0.	0.	0.

Problem 620	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	190	190	183	264	325	539	272	14533
normalized size	1	1.	0.96	1.39	1.71	2.84	1.43	76.49
time (sec)	N/A	0.271	0.202	0.01	1.45	3.295	9.288	6.895

Problem 621	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	262	262	220	345	0	0	0	0
normalized size	1	1.	0.84	1.32	0.	0.	0.	0.
time (sec)	N/A	0.779	0.415	0.599	0.	0.	0.	0.

Problem 622	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	194	249	312	541	311	0
normalized size	1	1.	1.04	1.34	1.68	2.91	1.67	0.
time (sec)	N/A	0.315	0.252	0.01	1.471	4.128	10.327	0.

Problem 623	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	317	317	260	465	572	782	593	1004
normalized size	1	1.	0.82	1.47	1.8	2.47	1.87	3.17
time (sec)	N/A	0.34	0.307	0.004	1.495	2.482	25.235	1.392

Problem 624	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	653	653	515	363	0	0	0	0
normalized size	1	1.	0.79	0.56	0.	0.	0.	0.
time (sec)	N/A	1.053	0.93	1.555	0.	0.	0.	0.

Problem 625	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	559	559	454	2854	0	0	0	0
normalized size	1	1.	0.81	5.11	0.	0.	0.	0.
time (sec)	N/A	0.911	0.358	0.512	0.	0.	0.	0.

Problem 626	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	579	579	456	285	0	0	0	0
normalized size	1	1.	0.79	0.49	0.	0.	0.	0.
time (sec)	N/A	0.904	0.349	0.344	0.	0.	0.	0.

Problem 627	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	491	491	399	2749	0	0	0	0
normalized size	1	1.	0.81	5.6	0.	0.	0.	0.
time (sec)	N/A	0.736	0.142	0.221	0.	0.	0.	0.

Problem 628	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	541	541	490	236	0	0	0	0
normalized size	1	1.	0.91	0.44	0.	0.	0.	0.
time (sec)	N/A	0.739	0.411	0.062	0.	0.	0.	0.

Problem 629	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	518	518	441	355	0	0	0	0
normalized size	1	1.	0.85	0.69	0.	0.	0.	0.
time (sec)	N/A	0.93	0.714	0.158	0.	0.	0.	0.

Problem 630	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	579	579	455	363	0	0	0	0
normalized size	1	1.	0.79	0.63	0.	0.	0.	0.
time (sec)	N/A	0.916	0.377	0.511	0.	0.	0.	0.

Problem 631	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	573	573	483	419	0	0	0	0
normalized size	1	1.	0.84	0.73	0.	0.	0.	0.
time (sec)	N/A	0.988	2.275	0.237	0.	0.	0.	0.

Problem 632	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	649	649	531	472	0	0	0	0
normalized size	1	1.	0.82	0.73	0.	0.	0.	0.
time (sec)	N/A	0.962	0.435	0.544	0.	0.	0.	0.

Problem 633	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	574	574	593	2907	0	0	0	0
normalized size	1	1.	1.03	5.06	0.	0.	0.	0.
time (sec)	N/A	0.956	1.034	0.523	0.	0.	0.	0.

Problem 634	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	87	414	0	830	0	0
normalized size	1	1.	1.05	4.99	0.	10.	0.	0.
time (sec)	N/A	0.059	0.147	0.032	0.	2.716	0.	0.

Problem 635	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	C	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	597	597	0	491	0	0	0	0
normalized size	1	1.	0.	0.82	0.	0.	0.	0.
time (sec)	N/A	1.009	3.624	0.234	0.	0.	0.	0.

Problem 636	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	C	F	F	F(-1)	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	632	632	0	679	0	0	0	0
normalized size	1	1.	0.	1.07	0.	0.	0.	0.
time (sec)	N/A	1.045	5.861	0.346	0.	0.	0.	0.

Problem 637	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	787	787	649	1738	0	0	0	0
normalized size	1	1.	0.82	2.21	0.	0.	0.	0.
time (sec)	N/A	2.027	1.51	1.484	0.	0.	0.	0.

Problem 638	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	745	745	603	1677	0	0	0	0
normalized size	1	1.	0.81	2.25	0.	0.	0.	0.
time (sec)	N/A	1.943	1.17	0.645	0.	0.	0.	0.

Problem 639	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	757	757	591	1687	0	0	0	0
normalized size	1	1.	0.78	2.23	0.	0.	0.	0.
time (sec)	N/A	0.995	1.691	0.547	0.	0.	0.	0.

Problem 640	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	795	795	672	1839	0	0	0	0
normalized size	1	1.	0.85	2.31	0.	0.	0.	0.
time (sec)	N/A	1.998	1.476	2.112	0.	0.	0.	0.

Problem 641	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	705	705	973	5124	0	0	0	0
normalized size	1	1.	1.38	7.27	0.	0.	0.	0.
time (sec)	N/A	1.095	6.486	1.639	0.	0.	0.	0.

Problem 642	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	152	1055	0	1891	0	0
normalized size	1	1.	0.99	6.9	0.	12.36	0.	0.
time (sec)	N/A	0.194	0.537	0.018	0.	3.999	0.	0.

Problem 643	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	141	1017	0	1604	0	0
normalized size	1	1.	1.06	7.65	0.	12.06	0.	0.
time (sec)	N/A	0.095	0.576	0.012	0.	3.902	0.	0.

Problem 644	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	C	F	F	F(-1)	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	727	727	0	1379	0	0	0	0
normalized size	1	1.	0.	1.9	0.	0.	0.	0.
time (sec)	N/A	1.132	6.628	0.461	0.	0.	0.	0.

Problem 645	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	C	F	F	F(-1)	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	783	783	0	1816	0	0	0	0
normalized size	1	1.	0.	2.32	0.	0.	0.	0.
time (sec)	N/A	1.175	9.259	0.622	0.	0.	0.	0.

Problem 646	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	1082	1082	1014	3107	0	0	0	0
normalized size	1	1.	0.94	2.87	0.	0.	0.	0.
time (sec)	N/A	3.384	5.883	1.096	0.	0.	0.	0.

Problem 647	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	1092	1092	1064	2259	0	0	0	0
normalized size	1	1.	0.97	2.07	0.	0.	0.	0.
time (sec)	N/A	2.611	6.029	1.247	0.	0.	0.	0.

Problem 648	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	1092	1092	1055	3110	0	0	0	0
normalized size	1	1.	0.97	2.85	0.	0.	0.	0.
time (sec)	N/A	1.248	6.063	0.734	0.	0.	0.	0.

Problem 649	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.022	5.899	0.514	0.	0.	0.	0.

Problem 650	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.023	4.091	0.421	0.	0.	0.	0.

Problem 651	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	B	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	70	70	74	0	0	651	0	0
normalized size	1	1.	1.06	0.	0.	9.3	0.	0.
time (sec)	N/A	0.099	0.117	0.313	0.	2.31	0.	0.

Problem 652	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	146	146	190	0	0	1418	0	0
normalized size	1	1.	1.3	0.	0.	9.71	0.	0.
time (sec)	N/A	0.16	0.24	0.323	0.	2.708	0.	0.

Problem 653	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	226	226	188	0	0	2700	0	0
normalized size	1	1.	0.83	0.	0.	11.95	0.	0.
time (sec)	N/A	0.825	0.433	0.325	0.	3.492	0.	0.

Problem 654	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	484	455	0	0	0	0	0	0
normalized size	1	0.94	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.376	5.318	22.783	0.	0.	0.	0.

Problem 655	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	293	272	224	0	0	0	0	0
normalized size	1	0.93	0.76	0.	0.	0.	0.	0.
time (sec)	N/A	0.415	0.28	8.931	0.	0.	0.	0.

Problem 656	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	148	122	0	0	0	0	0
normalized size	1	0.92	0.76	0.	0.	0.	0.	0.
time (sec)	N/A	0.166	0.18	3.367	0.	0.	0.	0.

Problem 657	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.062	8.545	0.883	0.	0.	0.	0.

Problem 658	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.059	10.292	0.393	0.	0.	0.	0.

Problem 659	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	569	569	435	1194	944	1277	989	1642
normalized size	1	1.	0.76	2.1	1.66	2.24	1.74	2.89
time (sec)	N/A	0.963	0.494	0.125	1.53	2.26	17.951	1.387

Problem 660	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	335	335	291	635	590	790	595	915
normalized size	1	1.	0.87	1.9	1.76	2.36	1.78	2.73
time (sec)	N/A	0.557	0.321	0.075	1.481	2.19	6.242	1.33

Problem 661	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	148	276	298	400	279	400
normalized size	1	1.	0.95	1.77	1.91	2.56	1.79	2.56
time (sec)	N/A	0.261	0.244	0.049	1.447	2.035	1.594	1.322

Problem 662	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	47	72	97	159	82	101
normalized size	1	1.	1.	1.53	2.06	3.38	1.74	2.15
time (sec)	N/A	0.06	0.042	0.042	1.415	1.972	0.301	1.27

Problem 663	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	821	821	1101	0	0	0	0	0
normalized size	1	1.	1.34	0.	0.	0.	0.	0.
time (sec)	N/A	1.342	0.777	0.711	0.	0.	0.	0.

Problem 664	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.037	16.879	0.379	0.	0.	0.	0.

Problem 665	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.039	12.131	0.368	0.	0.	0.	0.

Problem 666	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.044	3.918	0.293	0.	0.	0.	0.

Problem 667	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.044	8.17	0.301	0.	0.	0.	0.

Problem 668	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	387	379	253	310	0	0	0	846
normalized size	1	0.98	0.65	0.8	0.	0.	0.	2.19
time (sec)	N/A	0.77	0.615	0.046	0.	0.	0.	1.394

Problem 669	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	175	125	142	0	0	0	317
normalized size	1	0.98	0.7	0.79	0.	0.	0.	1.77
time (sec)	N/A	0.335	0.268	0.038	0.	0.	0.	1.243

Problem 670	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	44	48	0	0	0	66
normalized size	1	1.	0.83	0.91	0.	0.	0.	1.25
time (sec)	N/A	0.063	0.025	0.026	0.	0.	0.	1.328

Problem 671	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.036	0.684	0.523	0.	0.	0.	0.

Problem 672	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	F(-2)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.034	3.451	1.979	0.	0.	0.	0.

Problem 673	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.042	1.252	0.253	0.	0.	0.	0.

Problem 674	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.044	1.101	0.235	0.	0.	0.	0.

Problem 675	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.047	1.57	0.184	0.	0.	0.	0.

Problem 676	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.048	3.787	0.185	0.	0.	0.	0.

Problem 677	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	498	486	359	795	0	0	0	3137
normalized size	1	0.98	0.72	1.6	0.	0.	0.	6.3
time (sec)	N/A	0.761	2.081	0.092	0.	0.	0.	1.672

Problem 678	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	249	241	191	367	0	0	0	1222
normalized size	1	0.97	0.77	1.47	0.	0.	0.	4.91
time (sec)	N/A	0.418	0.943	0.071	0.	0.	0.	1.491

Problem 679	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	82	72	76	0	0	0	259
normalized size	1	0.95	0.84	0.88	0.	0.	0.	3.01
time (sec)	N/A	0.168	0.163	0.	0.	0.	0.	1.305

Problem 680	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.034	20.526	0.688	0.	0.	0.	0.

Problem 681	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.033	49.753	2.052	0.	0.	0.	0.

Problem 682	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.04	6.871	0.261	0.	0.	0.	0.

Problem 683	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.041	11.193	0.242	0.	0.	0.	0.

Problem 684	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.044	25.026	0.187	0.	0.	0.	0.

Problem 685	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.043	48.412	0.185	0.	0.	0.	0.

Problem 686	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	754	754	400	1137	0	0	0	1751
normalized size	1	1.	0.53	1.51	0.	0.	0.	2.32
time (sec)	N/A	2.265	1.56	0.159	0.	0.	0.	3.219

Problem 687	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	369	369	244	542	0	0	0	865
normalized size	1	1.	0.66	1.47	0.	0.	0.	2.34
time (sec)	N/A	1.027	0.614	0.112	0.	0.	0.	2.384

Problem 688	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	120	120	119	178	0	0	0	266
normalized size	1	1.	0.99	1.48	0.	0.	0.	2.22
time (sec)	N/A	0.271	0.093	0.001	0.	0.	0.	1.508

Problem 689	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.053	9.965	0.202	0.	0.	0.	0.

Problem 690	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	F(-2)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.049	21.252	0.501	0.	0.	0.	0.

Problem 691	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	482	482	873	835	0	0	0	2699
normalized size	1	1.	1.81	1.73	0.	0.	0.	5.6
time (sec)	N/A	1.424	10.102	0.154	0.	0.	0.	3.823

Problem 692	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	159	159	291	270	0	0	0	879
normalized size	1	1.	1.83	1.7	0.	0.	0.	5.53
time (sec)	N/A	0.232	2.742	0.	0.	0.	0.	2.181

Problem 693	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.062	3.384	0.204	0.	0.	0.	0.

Problem 694	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	F(-1)	F(-2)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.059	11.302	0.562	0.	0.	0.	0.

Problem 695	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	679	679	401	545	0	0	0	1314
normalized size	1	1.	0.59	0.8	0.	0.	0.	1.94
time (sec)	N/A	1.504	1.574	0.101	0.	0.	0.	3.086

Problem 696	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	329	329	246	248	0	0	0	655
normalized size	1	1.	0.75	0.75	0.	0.	0.	1.99
time (sec)	N/A	0.637	0.605	0.068	0.	0.	0.	2.567

Problem 697	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	C
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	101	101	121	83	0	0	0	215
normalized size	1	1.	1.2	0.82	0.	0.	0.	2.13
time (sec)	N/A	0.095	0.096	0.	0.	0.	0.	1.791

Problem 698	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.057	0.145	0.209	0.	0.	0.	0.

Problem 699	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	F(-1)	F(-2)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.054	0.279	0.478	0.	0.	0.	0.

Problem 700	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	394	394	417	446	0	0	0	0
normalized size	1	1.	1.06	1.13	0.	0.	0.	0.
time (sec)	N/A	0.798	1.173	0.113	0.	0.	0.	0.

Problem 701	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	137	137	167	149	0	0	0	0
normalized size	1	1.	1.22	1.09	0.	0.	0.	0.
time (sec)	N/A	0.268	0.308	0.	0.	0.	0.	0.

Problem 702	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.064	0.159	0.201	0.	0.	0.	0.

Problem 703	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	F(-1)	F(-2)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.06	0.295	0.503	0.	0.	0.	0.

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [621] had the largest ratio of [0.7619]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	5	5	1.	23	0.217
2	A	6	6	1.	23	0.261
3	A	5	5	1.	23	0.217
4	A	4	3	1.	21	0.143
5	A	5	4	1.	20	0.2
6	A	8	8	1.	23	0.348
7	A	6	7	1.	23	0.304
8	A	8	8	1.	23	0.348
9	A	6	7	1.	23	0.304
10	A	6	6	1.	25	0.24
11	A	7	8	1.	25	0.32
12	A	5	5	1.	25	0.2
13	A	5	3	1.	23	0.13
14	A	5	5	1.	22	0.227
15	A	12	8	1.	25	0.32
16	A	7	7	1.	25	0.28
17	A	12	10	1.	25	0.4
18	A	7	8	1.	25	0.32
19	A	5	5	1.	25	0.2
20	A	8	7	1.	25	0.28
21	A	5	5	1.	25	0.2
22	A	6	3	1.	23	0.13
23	A	5	5	1.	22	0.227
24	A	17	8	1.	25	0.32
25	A	7	7	1.	25	0.28
26	A	17	10	1.	25	0.4
27	A	8	8	1.	25	0.32
28	A	12	8	1.	25	0.32
29	A	8	8	1.	25	0.32
30	A	8	6	1.	25	0.24
31	A	5	5	1.	23	0.217
32	A	6	4	1.	22	0.182
33	A	7	5	1.	25	0.2
34	A	10	8	1.	25	0.32
35	A	9	7	1.	25	0.28
36	A	15	9	1.	25	0.36
37	A	12	9	1.	25	0.36
38	A	8	8	1.	25	0.32
39	A	8	6	1.	25	0.24
40	A	2	2	1.	23	0.087
41	A	8	6	1.	22	0.273
42	A	9	7	1.	25	0.28
43	A	13	11	1.	25	0.44

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
44	A	12	9	1.	25	0.36
45	A	19	11	1.1	25	0.44
46	A	12	8	1.	25	0.32
47	A	4	3	1.	25	0.12
48	A	10	7	1.	25	0.28
49	A	3	3	1.	23	0.13
50	A	10	6	1.	22	0.273
51	A	12	8	1.	25	0.32
52	A	16	11	1.	25	0.44
53	A	16	10	1.	25	0.4
54	A	23	11	1.16	25	0.44
55	A	7	4	1.	27	0.148
56	A	5	4	1.	27	0.148
57	A	3	3	1.	24	0.125
58	A	3	3	1.	27	0.111
59	A	3	2	1.	27	0.074
60	A	6	5	1.	27	0.185
61	A	7	5	1.	27	0.185
62	A	6	4	1.	27	0.148
63	A	6	4	1.	27	0.148
64	A	2	1	1.	25	0.04
65	A	8	6	1.	27	0.222
66	A	8	6	1.	27	0.222
67	A	10	7	1.	27	0.259
68	A	10	6	1.	27	0.222
69	A	8	6	1.	27	0.222
70	A	6	5	1.	24	0.208
71	A	6	5	1.	27	0.185
72	A	6	5	1.	27	0.185
73	A	4	3	1.	27	0.111
74	A	7	6	1.	27	0.222
75	A	8	6	1.	27	0.222
76	A	9	6	1.	27	0.222
77	A	7	5	1.	27	0.185
78	A	7	5	1.	27	0.185
79	A	7	5	1.	27	0.185
80	A	3	2	1.	25	0.08
81	A	10	7	1.	27	0.259
82	A	11	8	1.	27	0.296
83	A	11	8	1.	27	0.296
84	A	14	8	1.	27	0.296
85	A	12	8	1.	27	0.296
86	A	8	6	1.	24	0.25
87	A	10	8	1.	27	0.296

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
88	A	10	7	1.	27	0.259
89	A	10	7	1.	27	0.259
90	A	4	3	1.	27	0.111
91	A	8	7	1.	27	0.259
92	A	8	6	1.	27	0.222
93	A	7	5	1.	27	0.185
94	A	7	5	1.	27	0.185
95	A	3	2	1.	25	0.08
96	A	13	8	1.	27	0.296
97	A	13	9	1.	27	0.333
98	A	14	9	1.	27	0.333
99	A	3	3	1.	14	0.214
100	A	3	3	1.71	24	0.125
101	A	5	3	1.	22	0.136
102	A	4	4	1.	22	0.182
103	A	3	3	1.	22	0.136
104	A	2	2	1.	20	0.1
105	A	1	1	1.	19	0.053
106	A	6	4	1.	22	0.182
107	A	2	2	1.	22	0.091
108	A	8	6	1.	22	0.273
109	A	6	4	1.	27	0.148
110	A	6	4	1.	27	0.148
111	A	4	4	1.	27	0.148
112	A	4	4	1.	27	0.148
113	A	2	2	1.	25	0.08
114	A	2	2	1.	24	0.083
115	A	7	5	1.	27	0.185
116	A	2	2	1.	27	0.074
117	A	9	7	1.	27	0.259
118	A	4	4	1.	27	0.148
119	A	8	7	1.04	27	0.259
120	A	8	7	1.	27	0.259
121	A	5	5	1.03	27	0.185
122	A	4	4	1.	27	0.148
123	A	2	2	1.	25	0.08
124	A	2	2	1.	24	0.083
125	A	9	7	1.	27	0.259
126	A	7	7	1.	27	0.259
127	A	12	9	1.	27	0.333
128	A	11	8	1.	27	0.296
129	A	12	7	1.	27	0.259
130	A	9	6	1.07	27	0.222
131	A	8	6	1.	27	0.222

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
132	A	5	4	1.03	27	0.148
133	A	4	3	1.	27	0.111
134	A	3	3	1.	25	0.12
135	A	4	4	1.	24	0.167
136	A	12	8	1.	27	0.296
137	A	8	7	1.	27	0.259
138	A	16	11	1.	27	0.407
139	A	12	7	1.	27	0.259
140	A	6	4	1.	20	0.2
141	A	1	1	1.	30	0.033
142	A	2	2	1.	31	0.065
143	A	6	7	1.	25	0.28
144	A	5	6	1.	25	0.24
145	A	4	5	1.	23	0.217
146	A	0	0	0.	0	0.
147	A	0	0	0.	0	0.
148	A	0	0	0.	0	0.
149	A	9	6	1.	27	0.222
150	A	6	5	1.	27	0.185
151	A	3	3	1.	27	0.111
152	A	2	2	1.	27	0.074
153	A	4	4	1.	27	0.148
154	A	6	4	1.	27	0.148
155	A	1	1	1.	22	0.045
156	A	11	10	1.	25	0.4
157	A	14	6	1.	25	0.24
158	A	9	10	1.	25	0.4
159	A	7	6	1.	23	0.261
160	A	6	4	1.	22	0.182
161	A	10	10	1.	25	0.4
162	A	12	9	1.	25	0.36
163	A	10	10	1.	25	0.4
164	A	16	8	1.	25	0.32
165	A	16	11	1.	27	0.407
166	A	25	7	1.	27	0.259
167	A	14	11	1.	27	0.407
168	A	9	7	1.	25	0.28
169	A	10	5	1.	24	0.208
170	A	17	12	1.	27	0.444
171	A	17	11	1.	27	0.407
172	A	17	12	1.	27	0.444
173	A	24	10	1.	27	0.37
174	A	21	11	1.	27	0.407
175	A	40	9	1.	27	0.333

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
176	A	19	11	1.	27	0.407
177	A	11	7	1.	25	0.28
178	A	14	5	1.	24	0.208
179	A	26	13	1.	27	0.482
180	A	24	12	1.	27	0.444
181	A	28	15	1.	27	0.556
182	A	31	12	1.	27	0.444
183	A	16	10	1.	27	0.37
184	A	10	10	1.	27	0.37
185	A	11	8	1.	27	0.296
186	A	6	6	1.	25	0.24
187	A	8	5	1.	24	0.208
188	A	9	6	1.	27	0.222
189	A	15	10	1.	27	0.37
190	A	12	9	1.	27	0.333
191	A	24	11	1.	27	0.407
192	A	15	14	1.	27	0.518
193	A	10	9	1.	27	0.333
194	A	11	8	1.	27	0.296
195	A	3	3	1.	25	0.12
196	A	11	8	1.	24	0.333
197	A	12	9	1.	27	0.333
198	A	20	14	1.	27	0.518
199	A	17	15	1.	27	0.556
200	A	32	15	1.	27	0.556
201	A	16	13	1.	27	0.482
202	A	8	6	1.	27	0.222
203	A	15	10	1.	27	0.37
204	A	5	5	1.	25	0.2
205	A	15	9	1.	24	0.375
206	A	17	11	1.	27	0.407
207	A	27	15	1.	27	0.556
208	A	23	19	1.	27	0.704
209	A	43	17	1.	27	0.63
210	A	14	8	1.	29	0.276
211	A	10	6	1.	29	0.207
212	A	5	4	1.	27	0.148
213	A	5	5	1.	26	0.192
214	A	12	8	1.	29	0.276
215	A	7	7	1.	29	0.241
216	A	13	10	1.	29	0.345
217	A	9	9	1.	29	0.31
218	A	20	14	1.	29	0.483
219	A	17	11	1.	29	0.379

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
220	A	6	6	1.	27	0.222
221	A	10	8	1.01	26	0.308
222	A	17	12	1.	29	0.414
223	A	14	13	1.	29	0.448
224	A	18	15	1.	29	0.517
225	A	16	11	1.	29	0.379
226	A	27	18	1.	29	0.621
227	A	25	14	1.	29	0.483
228	A	6	6	1.	27	0.222
229	A	16	8	1.	26	0.308
230	A	23	16	1.	29	0.552
231	A	23	15	1.	29	0.517
232	A	25	20	1.	29	0.69
233	A	27	15	1.	29	0.517
234	A	14	7	1.	29	0.241
235	A	11	6	1.	29	0.207
236	A	9	7	1.	29	0.241
237	A	6	6	1.03	29	0.207
238	A	4	3	1.	27	0.111
239	A	2	2	1.	26	0.077
240	A	9	6	1.	29	0.207
241	A	6	6	1.	29	0.207
242	A	14	11	1.	29	0.379
243	A	9	9	1.	29	0.31
244	A	22	13	1.	29	0.448
245	A	15	13	1.	29	0.448
246	A	13	9	1.	29	0.31
247	A	8	8	1.	29	0.276
248	A	7	5	1.	27	0.185
249	A	6	6	1.	26	0.231
250	A	16	11	1.	29	0.379
251	A	14	10	1.	29	0.345
252	A	27	15	1.	29	0.517
253	A	24	11	1.	29	0.379
254	A	26	11	1.	29	0.379
255	A	17	10	1.	29	0.345
256	A	16	7	1.	29	0.241
257	A	9	9	1.	29	0.31
258	A	9	7	1.	27	0.259
259	A	9	9	1.	26	0.346
260	A	25	13	1.	29	0.448
261	A	19	14	1.	29	0.483
262	A	39	18	1.	29	0.621
263	A	32	15	1.	29	0.517

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
264	A	10	5	1.	24	0.208
265	A	8	7	1.	24	0.292
266	A	5	5	1.	24	0.208
267	A	3	3	1.	22	0.136
268	A	1	1	1.	21	0.048
269	A	8	5	1.	24	0.208
270	A	6	6	1.	24	0.25
271	A	13	10	1.	24	0.417
272	A	2	2	1.	22	0.091
273	A	6	6	1.	22	0.273
274	A	9	9	1.	22	0.409
275	A	13	10	1.	22	0.454
276	F	0	0	N/A	0	N/A
277	F	0	0	N/A	0	N/A
278	F	0	0	N/A	0	N/A
279	A	0	0	0.	0	0.
280	A	0	0	0.	0	0.
281	A	0	0	0.	0	0.
282	A	0	0	0.	0	0.
283	A	0	0	0.	0	0.
284	A	0	0	0.	0	0.
285	A	0	0	0.	0	0.
286	A	0	0	0.	0	0.
287	A	0	0	0.	0	0.
288	A	0	0	0.	0	0.
289	A	24	13	1.	20	0.65
290	A	17	11	1.	20	0.55
291	A	10	7	1.	18	0.389
292	A	10	6	1.	20	0.3
293	A	18	10	1.	20	0.5
294	A	28	11	1.	20	0.55
295	A	24	9	1.	22	0.409
296	A	14	8	1.	22	0.364
297	A	6	5	1.	22	0.227
298	A	2	2	1.	22	0.091
299	A	7	7	1.	22	0.318
300	A	11	11	1.	22	0.5
301	A	17	12	1.	22	0.546
302	A	0	0	0.	0	0.
303	A	13	4	1.	24	0.167
304	A	10	6	1.	24	0.25
305	A	6	4	1.	24	0.167
306	A	4	3	1.	22	0.136
307	A	1	1	1.	21	0.048

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
308	A	10	6	1.	24	0.25
309	A	7	7	1.	24	0.292
310	A	18	10	1.	24	0.417
311	A	7	3	1.	20	0.15
312	A	6	3	1.	20	0.15
313	A	5	3	1.	18	0.167
314	A	0	0	0.	0	0.
315	A	0	0	0.	0	0.
316	A	12	5	1.	28	0.179
317	A	12	5	0.98	28	0.179
318	A	6	5	1.	28	0.179
319	A	9	5	0.97	26	0.192
320	A	6	5	1.	25	0.2
321	A	0	0	0.	0	0.
322	A	0	0	0.	0	0.
323	A	0	0	0.	0	0.
324	A	0	0	0.	0	0.
325	A	15	5	0.98	28	0.179
326	A	12	5	1.	28	0.179
327	A	12	5	0.98	26	0.192
328	A	9	5	1.	25	0.2
329	A	0	0	0.	0	0.
330	A	0	0	0.	0	0.
331	A	0	0	0.	0	0.
332	A	0	0	0.	0	0.
333	A	15	5	0.98	28	0.179
334	A	15	5	1.	28	0.179
335	A	15	5	0.98	26	0.192
336	A	12	5	1.	25	0.2
337	A	0	0	0.	0	0.
338	A	0	0	0.	0	0.
339	A	0	0	0.	0	0.
340	A	0	0	0.	0	0.
341	A	5	3	1.	24	0.125
342	A	5	3	1.	24	0.125
343	A	4	3	1.	24	0.125
344	A	4	3	1.	24	0.125
345	A	2	2	1.	22	0.091
346	A	1	1	1.	21	0.048
347	A	0	0	0.	0	0.
348	A	0	0	0.	0	0.
349	A	12	5	0.98	28	0.179
350	A	9	5	1.	28	0.179
351	A	9	5	0.97	28	0.179

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
352	A	6	5	1.	28	0.179
353	A	4	4	0.93	26	0.154
354	A	1	1	1.	25	0.04
355	A	0	0	0.	0	0.
356	A	0	0	0.	0	0.
357	A	0	0	0.	0	0.
358	A	0	0	0.	0	0.
359	A	0	0	0.	0	0.
360	A	0	0	0.	0	0.
361	A	0	0	0.	0	0.
362	A	0	0	0.	0	0.
363	A	0	0	0.	0	0.
364	A	0	0	0.	0	0.
365	A	0	0	0.	0	0.
366	A	0	0	0.	0	0.
367	A	0	0	0.	0	0.
368	A	0	0	0.	0	0.
369	A	0	0	0.	0	0.
370	A	0	0	0.	0	0.
371	A	0	0	0.	0	0.
372	A	0	0	0.	0	0.
373	A	0	0	0.	0	0.
374	A	8	4	1.	20	0.2
375	A	7	4	1.	20	0.2
376	A	6	4	1.	18	0.222
377	A	0	0	0.	0	0.
378	A	0	0	0.	0	0.
379	A	2	1	1.	33	0.03
380	A	0	0	0.	0	0.
381	A	22	6	0.98	28	0.214
382	A	16	7	1.	28	0.25
383	A	14	7	1.32	26	0.269
384	A	7	7	1.	25	0.28
385	A	0	0	0.	0	0.
386	A	0	0	0.	0	0.
387	A	0	0	0.	0	0.
388	A	0	0	0.	0	0.
389	A	0	0	0.	0	0.
390	A	28	6	0.99	28	0.214
391	A	19	6	1.	28	0.214
392	A	22	8	0.98	26	0.308
393	A	10	6	1.	25	0.24
394	A	0	0	0.	0	0.
395	A	0	0	0.	0	0.

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
396	A	0	0	0.	0	0.
397	A	0	0	0.	0	0.
398	A	0	0	0.	0	0.
399	A	34	6	0.99	28	0.214
400	A	28	6	1.	28	0.214
401	A	28	8	0.99	26	0.308
402	A	13	6	1.	25	0.24
403	A	0	0	0.	0	0.
404	A	0	0	0.	0	0.
405	A	0	0	0.	0	0.
406	A	0	0	0.	0	0.
407	A	0	0	0.	0	0.
408	A	13	6	0.98	28	0.214
409	A	10	6	1.	28	0.214
410	A	10	6	0.97	28	0.214
411	A	7	7	1.	28	0.25
412	A	5	5	1.	26	0.192
413	A	1	1	1.	25	0.04
414	A	0	0	0.	0	0.
415	A	0	0	0.	0	0.
416	A	0	0	0.	0	0.
417	A	0	0	0.	0	0.
418	A	0	0	0.	0	0.
419	A	0	0	0.	0	0.
420	A	0	0	0.	0	0.
421	A	0	0	0.	0	0.
422	A	0	0	0.	0	0.
423	A	0	0	0.	0	0.
424	A	0	0	0.	0	0.
425	A	0	0	0.	0	0.
426	A	0	0	0.	0	0.
427	A	0	0	0.	0	0.
428	A	0	0	0.	0	0.
429	A	0	0	0.	0	0.
430	A	1	1	1.	21	0.048
431	A	27	8	1.	27	0.296
432	A	32	8	1.	27	0.296
433	A	17	10	1.	25	0.4
434	A	14	8	1.	24	0.333
435	A	0	0	0.	0	0.
436	A	32	8	1.	29	0.276
437	A	42	8	1.	29	0.276
438	A	32	10	1.	27	0.37
439	A	19	8	1.	26	0.308

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
440	A	0	0	0.	0	0.
441	A	3	2	1.	38	0.053
442	A	15	9	1.	24	0.375
443	A	7	7	1.	24	0.292
444	A	2	2	1.	24	0.083
445	A	0	0	0.	0	0.
446	A	0	0	0.	0	0.
447	A	17	10	1.	24	0.417
448	A	8	7	1.	24	0.292
449	A	2	2	1.	24	0.083
450	A	0	0	0.	0	0.
451	A	27	12	1.	24	0.5
452	A	10	9	1.	24	0.375
453	A	2	2	1.	24	0.083
454	A	0	0	0.	0	0.
455	A	15	9	1.	24	0.375
456	A	7	7	1.	24	0.292
457	A	2	2	1.	24	0.083
458	A	0	0	0.	0	0.
459	A	0	0	0.	0	0.
460	A	17	10	1.	24	0.417
461	A	8	7	1.	24	0.292
462	A	2	2	1.	24	0.083
463	A	0	0	0.	0	0.
464	A	3	3	1.	19	0.158
465	A	10	5	1.	24	0.208
466	A	8	5	1.	24	0.208
467	A	6	5	1.	24	0.208
468	A	2	2	1.	24	0.083
469	A	0	0	0.	0	0.
470	A	0	0	0.	0	0.
471	A	10	5	1.	24	0.208
472	A	8	5	1.	24	0.208
473	A	6	6	1.	24	0.25
474	A	2	2	1.	24	0.083
475	A	0	0	0.	0	0.
476	A	0	0	0.	0	0.
477	A	12	8	1.	24	0.333
478	A	4	4	1.	24	0.167
479	A	2	2	1.	24	0.083
480	A	0	0	0.	0	0.
481	A	0	0	0.	0	0.
482	A	7	5	1.	29	0.172
483	A	10	5	1.	27	0.185

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
484	A	7	5	1.	26	0.192
485	A	0	0	0.	0	0.
486	A	0	0	0.	0	0.
487	A	13	5	1.	29	0.172
488	A	13	5	1.	27	0.185
489	A	10	5	1.	26	0.192
490	A	0	0	0.	0	0.
491	A	0	0	0.	0	0.
492	A	16	5	1.	29	0.172
493	A	16	5	1.	27	0.185
494	A	13	5	1.	26	0.192
495	A	0	0	0.	0	0.
496	A	0	0	0.	0	0.
497	A	0	0	0.	0	0.
498	A	9	4	1.	24	0.167
499	A	6	4	1.	24	0.167
500	A	4	3	1.	22	0.136
501	A	1	1	1.	21	0.048
502	A	0	0	0.	0	0.
503	A	0	0	0.	0	0.
504	A	13	8	1.	30	0.267
505	A	8	6	1.	30	0.2
506	A	4	4	1.	30	0.133
507	A	6	5	1.	30	0.167
508	A	8	8	1.	30	0.267
509	A	6	6	1.	30	0.2
510	A	12	9	1.	30	0.3
511	A	7	6	1.	30	0.2
512	A	8	6	1.	30	0.2
513	A	9	7	1.	30	0.233
514	A	10	10	1.	30	0.333
515	A	9	9	1.	30	0.3
516	A	9	7	1.	30	0.233
517	A	12	9	1.	30	0.3
518	A	13	8	1.	30	0.267
519	A	13	7	1.	30	0.233
520	A	7	9	1.	30	0.3
521	A	10	8	1.	30	0.267
522	A	13	7	1.	30	0.233
523	A	9	7	1.	30	0.233
524	A	6	5	1.	30	0.167
525	A	2	2	1.	30	0.067
526	A	5	6	1.	30	0.2
527	A	8	8	1.	30	0.267

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
528	A	7	9	1.	30	0.3
529	A	10	10	1.	30	0.333
530	A	8	8	1.	30	0.267
531	A	5	6	1.	30	0.2
532	A	3	3	1.	30	0.1
533	A	8	8	1.	30	0.267
534	A	10	8	1.	30	0.267
535	A	9	9	1.	30	0.3
536	A	6	6	1.	30	0.2
537	A	8	8	1.	30	0.267
538	A	8	8	1.	30	0.267
539	A	5	5	1.	30	0.167
540	A	23	13	1.	32	0.406
541	A	13	11	1.	32	0.344
542	A	6	6	1.	32	0.188
543	A	8	6	1.	32	0.188
544	A	19	13	1.	32	0.406
545	A	20	12	1.	32	0.375
546	A	19	15	1.	32	0.469
547	A	11	9	1.	32	0.281
548	A	13	11	1.	32	0.344
549	A	11	9	1.	32	0.281
550	A	23	15	1.	32	0.469
551	A	21	13	1.	32	0.406
552	A	17	9	1.	32	0.281
553	A	19	15	1.	32	0.469
554	A	23	13	1.	32	0.406
555	A	17	10	1.	32	0.312
556	A	28	19	1.	32	0.594
557	A	25	16	1.	32	0.5
558	A	17	10	1.	32	0.312
559	A	11	9	1.	32	0.281
560	A	8	6	1.	32	0.188
561	A	2	2	1.	32	0.062
562	A	16	11	1.	32	0.344
563	A	30	18	1.	32	0.562
564	A	28	19	1.	32	0.594
565	A	23	15	1.	32	0.469
566	A	19	13	1.	32	0.406
567	A	16	11	1.	32	0.344
568	A	7	7	1.	32	0.219
569	A	21	14	1.	32	0.438
570	A	25	16	1.	32	0.5
571	A	21	13	1.	32	0.406

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
572	A	20	12	1.	32	0.375
573	A	30	18	1.	32	0.562
574	A	21	14	1.	32	0.438
575	A	10	10	1.	32	0.312
576	A	11	7	1.	35	0.2
577	A	6	5	1.	33	0.152
578	A	6	6	1.	32	0.188
579	A	13	9	1.	35	0.257
580	A	8	8	1.	35	0.229
581	A	18	12	1.	35	0.343
582	A	7	7	1.	33	0.212
583	A	11	9	1.	32	0.281
584	A	18	13	1.	35	0.371
585	A	15	14	1.	35	0.4
586	A	6	6	1.	35	0.171
587	A	5	4	1.	33	0.121
588	A	2	2	1.	32	0.062
589	A	9	6	1.	35	0.171
590	A	7	7	1.	35	0.2
591	A	8	8	1.	35	0.229
592	A	8	6	1.	33	0.182
593	A	7	7	1.	32	0.219
594	A	16	11	1.	35	0.314
595	A	15	11	1.	35	0.314
596	A	5	5	1.	19	0.263
597	A	6	6	1.	19	0.316
598	A	5	5	1.	19	0.263
599	A	4	4	1.	17	0.235
600	A	4	3	1.	16	0.188
601	A	12	12	1.	19	0.632
602	A	5	6	1.	19	0.316
603	A	10	10	1.	19	0.526
604	A	6	7	1.	19	0.368
605	A	6	6	1.	21	0.286
606	A	7	8	1.	21	0.381
607	A	5	5	1.	21	0.238
608	A	5	5	1.	19	0.263
609	A	5	5	1.	18	0.278
610	A	14	12	1.	21	0.571
611	A	6	6	1.	21	0.286
612	A	13	14	1.	21	0.667
613	A	6	7	1.	21	0.333
614	A	5	5	1.	21	0.238
615	A	8	7	1.	21	0.333

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
616	A	5	5	1.	21	0.238
617	A	6	5	1.	19	0.263
618	A	5	5	1.	18	0.278
619	A	19	13	1.	21	0.619
620	A	6	6	1.	21	0.286
621	A	15	16	1.	21	0.762
622	A	8	8	1.	21	0.381
623	A	5	5	1.	18	0.278
624	A	27	12	1.	21	0.571
625	A	23	9	1.	21	0.429
626	A	23	9	1.	21	0.429
627	A	18	6	1.	19	0.316
628	A	18	6	1.	18	0.333
629	A	25	8	1.	21	0.381
630	A	24	11	1.	21	0.524
631	A	27	10	1.	21	0.476
632	A	29	12	1.	21	0.571
633	A	23	9	1.	21	0.429
634	A	3	3	1.	19	0.158
635	A	28	11	1.	21	0.524
636	A	30	13	1.	21	0.619
637	A	49	12	1.	21	0.571
638	A	46	10	1.	21	0.476
639	A	26	9	1.	18	0.5
640	A	50	14	1.	21	0.667
641	A	27	10	1.	21	0.476
642	A	7	8	1.	21	0.381
643	A	4	4	1.	19	0.21
644	A	32	12	1.	21	0.571
645	A	34	14	1.	21	0.667
646	A	80	11	1.	21	0.524
647	A	62	11	1.	21	0.524
648	A	34	10	1.	18	0.556
649	A	0	0	0.	0	0.
650	A	0	0	0.	0	0.
651	A	6	7	1.	20	0.35
652	A	7	9	1.	20	0.45
653	A	8	10	1.	20	0.5
654	A	6	7	0.94	23	0.304
655	A	5	6	0.93	23	0.261
656	A	4	5	0.92	21	0.238
657	A	0	0	0.	0	0.
658	A	0	0	0.	0	0.
659	A	26	7	1.	20	0.35

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
660	A	17	7	1.	20	0.35
661	A	10	7	1.	18	0.389
662	A	3	3	1.	10	0.3
663	A	22	7	1.	20	0.35
664	A	0	0	0.	0	0.
665	A	0	0	0.	0	0.
666	A	0	0	0.	0	0.
667	A	0	0	0.	0	0.
668	A	27	7	0.98	20	0.35
669	A	15	7	0.98	18	0.389
670	A	4	4	1.	10	0.4
671	A	0	0	0.	0	0.
672	A	0	0	0.	0	0.
673	A	0	0	0.	0	0.
674	A	0	0	0.	0	0.
675	A	0	0	0.	0	0.
676	A	0	0	0.	0	0.
677	A	26	7	0.98	20	0.35
678	A	15	7	0.97	18	0.389
679	A	5	5	0.95	10	0.5
680	A	0	0	0.	0	0.
681	A	0	0	0.	0	0.
682	A	0	0	0.	0	0.
683	A	0	0	0.	0	0.
684	A	0	0	0.	0	0.
685	A	0	0	0.	0	0.
686	A	42	10	1.	22	0.454
687	A	23	10	1.	20	0.5
688	A	7	7	1.	12	0.583
689	A	0	0	0.	0	0.
690	A	0	0	0.	0	0.
691	A	32	13	1.	20	0.65
692	A	8	8	1.	12	0.667
693	A	0	0	0.	0	0.
694	A	0	0	0.	0	0.
695	A	39	9	1.	22	0.409
696	A	21	9	1.	20	0.45
697	A	6	6	1.	12	0.5
698	A	0	0	0.	0	0.
699	A	0	0	0.	0	0.
700	A	21	9	1.	20	0.45
701	A	7	7	1.	12	0.583
702	A	0	0	0.	0	0.
703	A	0	0	0.	0	0.

Chapter 3

Listing of integrals

3.1 $\int x^4 \left(d-c^2dx^2\right) \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=128

$$-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{bd\left(1-c^2x^2\right)^{7/2}}{49c^5}-\frac{8bd\left(1-c^2x^2\right)^{5/2}}{175c^5}+\frac{bd\left(1-c^2x^2\right)^{3/2}}{105c^5}+\frac{2bd\sqrt{1}}{35}$$

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(35*c^5) + (b*d*(1 - c^2*x^2)^(3/2))/(105*c^5) -
(8*b*d*(1 - c^2*x^2)^(5/2))/(175*c^5) + (b*d*(1 - c^2*x^2)^(7/2))/(49*c^5)
+ (d*x^5*(a + b*ArcSin[c*x]))/5 - (c^2*d*x^7*(a + b*ArcSin[c*x]))/7
```

Rubi [A] time = 0.120213, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {14, 4687, 12, 446, 77}

$$-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{bd\left(1-c^2x^2\right)^{7/2}}{49c^5}-\frac{8bd\left(1-c^2x^2\right)^{5/2}}{175c^5}+\frac{bd\left(1-c^2x^2\right)^{3/2}}{105c^5}+\frac{2bd\sqrt{1}}{35}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(35*c^5) + (b*d*(1 - c^2*x^2)^(3/2))/(105*c^5) -
(8*b*d*(1 - c^2*x^2)^(5/2))/(175*c^5) + (b*d*(1 - c^2*x^2)^(7/2))/(49*c^5)
+ (d*x^5*(a + b*ArcSin[c*x]))/5 - (c^2*d*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rubi steps

$$\begin{aligned}\int x^4\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)dx &= \frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{dx^5\left(7-5c^2x^2\right)}{35\sqrt{1-c^2x^2}}\,dx\\ &= \frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{35}(bcd)\int\frac{x^5\left(7-5c^2x^2\right)}{\sqrt{1-c^2x^2}}\,d\\ &= \frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bcd)\,\text{Subst}\left(\int\frac{x^2\left(7-5\right.}{\sqrt{1-c}}\right.\\ &= \frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bcd)\,\text{Subst}\left(\int\left(\frac{2}{c^4\sqrt{1-}}\right.\right.\\ &= \frac{2bd\sqrt{1-c^2x^2}}{35c^5}+\frac{bd\left(1-c^2x^2\right)^{3/2}}{105c^5}-\frac{8bd\left(1-c^2x^2\right)^{5/2}}{175c^5}+\frac{bd\left(1-c^2x^2\right)^{7/2}}{49c^5}+\frac{1}{5}dx^5\left(\right.\end{aligned}$$

Mathematica [A] time = 0.135931, size = 87, normalized size = 0.68

$$\frac{d\left(-105ax^5\left(5c^2x^2-7\right)+\frac{b\sqrt{1-c^2x^2}\left(-75c^6x^6+57c^4x^4+76c^2x^2+152\right)}{c^5}-105bx^5\left(5c^2x^2-7\right)\sin^{-1}(cx)\right)}{3675}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*(-105*a*x^5*(-7 + 5*c^2*x^2) + (b*Sqrt[1 - c^2*x^2]*(152 + 76*c^2*x^2 +
57*c^4*x^4 - 75*c^6*x^6))/c^5 - 105*b*x^5*(-7 + 5*c^2*x^2)*ArcSin[c*x]))/36
75
```

Maple [A] time = 0.008, size = 130, normalized size = 1.

$$\frac{1}{c^5}\left(-da\left(\frac{c^7x^7}{7}-\frac{c^5x^5}{5}\right)-db\left(\frac{\arcsin(cx)\,c^7x^7}{7}-\frac{\arcsin(cx)\,c^5x^5}{5}+\frac{c^6x^6}{49}\sqrt{-c^2x^2+1}-\frac{19\,c^4x^4}{1225}\sqrt{-c^2x^2+1}-\frac{76\,c^2x^2}{3675}\sqrt{-c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^5*(-d*a*(1/7*c^7*x^7-1/5*c^5*x^5)-d*b*(1/7*arcsin(c*x)*c^7*x^7-1/5*arcs
in(c*x)*c^5*x^5+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-19/1225*c^4*x^4*(-c^2*x^2+1
)^(1/2)-76/3675*c^2*x^2*(-c^2*x^2+1)^(1/2)-152/3675*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.62084, size = 255, normalized size = 1.99

$$-\frac{1}{7}\,ac^2dx^7+\frac{1}{5}\,adx^5-\frac{1}{245}\left(35\,x^7\arcsin\left(cx\right)+\left(\frac{5\,\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\,\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\,\sqrt{-c^2x^2+}}{c^8}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*a*c^2*d*x^7 + 1/5*a*d*x^5 - 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x
^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c
^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^2*d + 1/75*(15*x^5*arcsin(c*x) + (3*
sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2
 + 1)/c^6)*c)*b*d
```

Fricas [A] time = 2.13976, size = 244, normalized size = 1.91

$$-\frac{525\,ac^7dx^7-735\,ac^5dx^5+105\left(5\,bc^7dx^7-7\,bc^5dx^5\right)\arcsin\left(cx\right)+\left(75\,bc^6dx^6-57\,bc^4dx^4-76\,bc^2dx^2-152\,bd\right)\sqrt{-c}}{3675\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*(525*a*c^7*d*x^7 - 735*a*c^5*d*x^5 + 105*(5*b*c^7*d*x^7 - 7*b*c^5*d
*x^5)*arcsin(c*x) + (75*b*c^6*d*x^6 - 57*b*c^4*d*x^4 - 76*b*c^2*d*x^2 - 152
*b*d)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 12.6751, size = 151, normalized size = 1.18

$$\begin{cases} -\frac{ac^2dx^7}{7}+\frac{adx^5}{5}-\frac{bc^2dx^7\operatorname{asin}(cx)}{7}-\frac{bcdx^6\sqrt{-c^2x^2+1}}{49}+\frac{bdx^5\operatorname{asin}(cx)}{5}+\frac{19bdx^4\sqrt{-c^2x^2+1}}{1225c}+\frac{76bdx^2\sqrt{-c^2x^2+1}}{3675c^3}+\frac{152bd\sqrt{-c^2x^2+1}}{3675c^5} & \text{for } c \neq \\ \frac{adx^5}{5} & \text{otherw} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**7/7 + a*d*x**5/5 - b*c**2*d*x**7*asin(c*x)/7 - b*c*
d*x**6*sqrt(-c**2*x**2 + 1)/49 + b*d*x**5*asin(c*x)/5 + 19*b*d*x**4*sqrt(-c
**2*x**2 + 1)/(1225*c) + 76*b*d*x**2*sqrt(-c**2*x**2 + 1)/(3675*c**3) + 152
*b*d*sqrt(-c**2*x**2 + 1)/(3675*c**5), Ne(c, 0)), (a*d*x**5/5, True))
```

Giac [A] time = 1.42701, size = 263, normalized size = 2.05

$$-\frac{1}{7}ac^2dx^7+\frac{1}{5}adx^5-\frac{(c^2x^2-1)^3bdx\arcsin(cx)}{7c^4}-\frac{8(c^2x^2-1)^2bdx\arcsin(cx)}{35c^4}-\frac{(c^2x^2-1)bdx\arcsin(cx)}{35c^4}-\frac{(c^2x^2-1)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/7*a*c^2*d*x^7 + 1/5*a*d*x^5 - 1/7*(c^2*x^2 - 1)^3*b*d*x*arcsin(c*x)/c^4
- 8/35*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^4 - 1/35*(c^2*x^2 - 1)*b*d*x*arc
sin(c*x)/c^4 - 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 2/35*b*d*x
*arcsin(c*x)/c^4 - 8/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 1/105
*(-c^2*x^2 + 1)^(3/2)*b*d/c^5 + 2/35*sqrt(-c^2*x^2 + 1)*b*d/c^5
```

3.2 $\int x^3 \left(d-c^2dx^2\right) \left(a+b\sin^{-1}(cx)\right) \, dx$

Optimal. Leaf size=123

$$-\frac{1}{6}c^2dx^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}+\frac{bdx\sqrt{1-c^2x^2}}{24c^3}-\frac{bd\sin^{-1}(cx)}{24c^4}$$

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(24*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2])/(36*c) - (
b*c*d*x^5*Sqrt[1 - c^2*x^2])/36 - (b*d*ArcSin[c*x])/(24*c^4) + (d*x^4*(a +
b*ArcSin[c*x]))/4 - (c^2*d*x^6*(a + b*ArcSin[c*x]))/6
```

Rubi [A] time = 0.0959112, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {14, 4687, 12, 459, 321, 216}

$$-\frac{1}{6}c^2dx^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}+\frac{bdx\sqrt{1-c^2x^2}}{24c^3}-\frac{bd\sin^{-1}(cx)}{24c^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(24*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2])/(36*c) - (
b*c*d*x^5*Sqrt[1 - c^2*x^2])/36 - (b*d*ArcSin[c*x])/(24*c^4) + (d*x^4*(a +
b*ArcSin[c*x]))/4 - (c^2*d*x^6*(a + b*ArcSin[c*x]))/6
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
```

```
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\begin{aligned}
\int x^3\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)dx &= \frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}c^2dx^6\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{dx^4\left(3-2c^2x^2\right)}{12\sqrt{1-c^2x^2}}\,dx\\
&= \frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}c^2dx^6\left(a+b\sin^{-1}(cx)\right)-\frac{1}{12}(bcd)\int\frac{x^4\left(3-2c^2x^2\right)}{\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}c^2dx^6\left(a+b\sin^{-1}(cx)\right)-\frac{1}{9}(bc\\
&= \frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}c^2dx^6\left(a+b\sin\right.\\
&= \frac{bdx\sqrt{1-c^2x^2}}{24c^3}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\\
&= \frac{bdx\sqrt{1-c^2x^2}}{24c^3}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}-\frac{bd\sin^{-1}(cx)}{24c^4}+\frac{1}{4}dx^4\left(a\right.
\end{aligned}$$

Mathematica [A] time = 0.0903986, size = 89, normalized size = 0.72

$$\frac{d\left(-6ac^4x^4\left(2c^2x^2-3\right)+bcx\sqrt{1-c^2x^2}\left(-2c^4x^4+2c^2x^2+3\right)-3b\left(4c^6x^6-6c^4x^4+1\right)\sin^{-1}(cx)\right)}{72c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*(-6*a*c^4*x^4*(-3 + 2*c^2*x^2) + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2
- 2*c^4*x^4) - 3*b*(1 - 6*c^4*x^4 + 4*c^6*x^6)*ArcSin[c*x]))/(72*c^4)
```

Maple [A] time = 0.008, size = 118, normalized size = 1.

$$\frac{1}{c^4}\left(-da\left(\frac{c^6x^6}{6}-\frac{c^4x^4}{4}\right)-db\left(\frac{\arcsin(cx)\,c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^5x^5}{36}\sqrt{-c^2x^2+1}-\frac{c^3x^3}{36}\sqrt{-c^2x^2+1}-\frac{cx}{24}\sqrt{-c^2x^2+1}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^4*(-d*a*(1/6*c^6*x^6-1/4*c^4*x^4)-d*b*(1/6*arcsin(c*x)*c^6*x^6-1/4*c^4*
x^4*arcsin(c*x)+1/36*c^5*x^5*(-c^2*x^2+1)^(1/2)-1/36*c^3*x^3*(-c^2*x^2+1)^(
1/2)-1/24*c*x*(-c^2*x^2+1)^(1/2)+1/24*arcsin(c*x)))
```

Maxima [A] time = 1.52922, size = 261, normalized size = 2.12

$$-\frac{1}{6}ac^2dx^6+\frac{1}{4}adx^4-\frac{1}{288}\left(48\,x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\arcsin\left(\right.}{\sqrt{c^2}c^6}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/6*a*c^2*d*x^6 + 1/4*a*d*x^4 - 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x
^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c
^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*c^2*d + 1/32*(8*x^4*a
rcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3
*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*d
```

Fricas [A] time = 2.0412, size = 221, normalized size = 1.8

$$-\frac{12\,ac^6dx^6-18\,ac^4dx^4+3\left(4\,bc^6dx^6-6\,bc^4dx^4+bd\right)\arcsin(cx)+\left(2\,bc^5dx^5-2\,bc^3dx^3-3\,bcdx\right)\sqrt{-c^2x^2+1}}{72\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/72*(12*a*c^6*d*x^6 - 18*a*c^4*d*x^4 + 3*(4*b*c^6*d*x^6 - 6*b*c^4*d*x^4 +
 b*d)*arcsin(c*x) + (2*b*c^5*d*x^5 - 2*b*c^3*d*x^3 - 3*b*c*d*x)*sqrt(-c^2*x
^2 + 1))/c^4
```

Sympy [A] time = 13.7657, size = 138, normalized size = 1.12

$$\begin{cases}-\frac{ac^2dx^6}{6}+\frac{adx^4}{4}-\frac{bc^2dx^6\operatorname{asin}(cx)}{6}-\frac{bcdx^5\sqrt{-c^2x^2+1}}{36}+\frac{bdx^4\operatorname{asin}(cx)}{4}+\frac{bdx^3\sqrt{-c^2x^2+1}}{36c}+\frac{bdx\sqrt{-c^2x^2+1}}{24c^3}-\frac{bd\operatorname{asin}(cx)}{24c^4} & \text{for}\ c\neq 0\\ \frac{adx^4}{4} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**6/6 + a*d*x**4/4 - b*c**2*d*x**6*asin(c*x)/6 - b*c*
d*x**5*sqrt(-c**2*x**2 + 1)/36 + b*d*x**4*asin(c*x)/4 + b*d*x**3*sqrt(-c**2
*x**2 + 1)/(36*c) + b*d*x*sqrt(-c**2*x**2 + 1)/(24*c**3) - b*d*asin(c*x)/(2
4*c**4), Ne(c, 0)), (a*d*x**4/4, True))
```

Giac [A] time = 1.37521, size = 220, normalized size = 1.79

$$-\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bdx}{36\,c^3}-\frac{\left(c^2x^2-1\right)^3bd\arcsin(cx)}{6\,c^4}+\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bdx}{36\,c^3}-\frac{\left(c^2x^2-1\right)^3ad}{6\,c^4}-\frac{\left(c^2x^2-1\right)^2bd\arcsin\left(\right.}{4\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*x/c^3 - 1/6*(c^2*x^2 - 1)^3*b*
d*arcsin(c*x)/c^4 + 1/36*(-c^2*x^2 + 1)^(3/2)*b*d*x/c^3 - 1/6*(c^2*x^2 - 1)
^3*a*d/c^4 - 1/4*(c^2*x^2 - 1)^2*b*d*arcsin(c*x)/c^4 + 1/24*sqrt(-c^2*x^2 +
 1)*b*d*x/c^3 - 1/4*(c^2*x^2 - 1)^2*a*d/c^4 + 1/24*b*d*arcsin(c*x)/c^4
```

3.3 $\int x^2 \left(d-c^2 d x^2\right) \left(a+b \sin^{-1}(cx)\right) \, dx$

Optimal. Leaf size=105

$$-\frac{1}{5}c^2 d x^5 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{bd\left(1-c^2x^2\right)^{5/2}}{25c^3}+\frac{bd\left(1-c^2x^2\right)^{3/2}}{45c^3}+\frac{2bd\sqrt{1-c^2x^2}}{15c^3}$$

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(15*c^3) + (b*d*(1 - c^2*x^2)^(3/2))/(45*c^3) - (
b*d*(1 - c^2*x^2)^(5/2))/(25*c^3) + (d*x^3*(a + b*ArcSin[c*x]))/3 - (c^2*d*
x^5*(a + b*ArcSin[c*x]))/5
```

Rubi [A] time = 0.103338, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {14, 4687, 12, 446, 77}

$$-\frac{1}{5}c^2 d x^5 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{bd\left(1-c^2x^2\right)^{5/2}}{25c^3}+\frac{bd\left(1-c^2x^2\right)^{3/2}}{45c^3}+\frac{2bd\sqrt{1-c^2x^2}}{15c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(15*c^3) + (b*d*(1 - c^2*x^2)^(3/2))/(45*c^3) - (
b*d*(1 - c^2*x^2)^(5/2))/(25*c^3) + (d*x^3*(a + b*ArcSin[c*x]))/3 - (c^2*d*
x^5*(a + b*ArcSin[c*x]))/5
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
```

```
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rubi steps

$$\int x^2 \left(d-c^2 d x^2\right) \left(a+b \sin^{-1}(cx)\right) dx = \frac{1}{3} d x^3 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{5} c^2 d x^5 \left(a+b \sin^{-1}(cx)\right) - (bc) \int \frac{d x^3 \left(5-3c^2 x^2\right)}{15\sqrt{1-c^2x^2}} dx$$

$$= \frac{1}{3} d x^3 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{5} c^2 d x^5 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{15}(bcd) \int \frac{x^3 \left(5-3c^2 x^2\right)}{\sqrt{1-c^2x^2}} dx$$

$$= \frac{1}{3} d x^3 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{5} c^2 d x^5 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{30}(bcd) \operatorname{Subst}\left(\int \frac{x \left(5-3c\right.}{\sqrt{1-c}}\right.$$

$$= \frac{1}{3} d x^3 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{5} c^2 d x^5 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{30}(bcd) \operatorname{Subst}\left(\int \left(\frac{2}{c^2\sqrt{1-}}\right.\right.$$

$$= \frac{2bd\sqrt{1-c^2x^2}}{15c^3} + \frac{bd\left(1-c^2x^2\right)^{3/2}}{45c^3} - \frac{bd\left(1-c^2x^2\right)^{5/2}}{25c^3} + \frac{1}{3} d x^3 \left(a+b \sin^{-1}(cx)\right) - \frac{1}{5}$$

Mathematica [A] time = 0.0962014, size = 85, normalized size = 0.81

$$\frac{d\left(a\left(75c^3x^3-45c^5x^5\right)+b\sqrt{1-c^2x^2}\left(-9c^4x^4+13c^2x^2+26\right)+15bc^3x^3\left(5-3c^2x^2\right)\sin^{-1}(cx)\right)}{225c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*(b*Sqrt[1 - c^2*x^2]*(26 + 13*c^2*x^2 - 9*c^4*x^4) + a*(75*c^3*x^3 - 45*
c^5*x^5) + 15*b*c^3*x^3*(5 - 3*c^2*x^2)*ArcSin[c*x]))/(225*c^3)
```

Maple [A] time = 0.006, size = 110, normalized size = 1.1

$$\frac{1}{c^3}\left(-da\left(\frac{c^5x^5}{5}-\frac{c^3x^3}{3}\right)-db\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^4x^4}{25}\sqrt{-c^2x^2+1}-\frac{13c^2x^2}{225}\sqrt{-c^2x^2+1}-\frac{26}{225}\sqrt{-c^2x^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^3*(-d*a*(1/5*c^5*x^5-1/3*c^3*x^3)-d*b*(1/5*arcsin(c*x)*c^5*x^5-1/3*c^3*
x^3*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-13/225*c^2*x^2*(-c^2*x^2+1)
^(1/2)-26/225*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.52165, size = 200, normalized size = 1.9

$$-\frac{1}{5}ac^2dx^5-\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^2d+\frac{1}{3}adx^3+\frac{1}{9}\left(3x^3\operatorname{arcs}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/5*a*c^2*d*x^5 - 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^2*d + 1/
3*a*d*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt
(-c^2*x^2 + 1)/c^4))*b*d
```

Fricas [A] time = 2.14777, size = 213, normalized size = 2.03

$$-\frac{45\,ac^5dx^5-75\,ac^3dx^3+15\left(3\,bc^5dx^5-5\,bc^3dx^3\right)\arcsin\left(cx\right)+\left(9\,bc^4dx^4-13\,bc^2dx^2-26\,bd\right)\sqrt{-c^2x^2+1}}{225\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/225*(45*a*c^5*d*x^5 - 75*a*c^3*d*x^3 + 15*(3*b*c^5*d*x^5 - 5*b*c^3*d*x^3
)*arcsin(c*x) + (9*b*c^4*d*x^4 - 13*b*c^2*d*x^2 - 26*b*d)*sqrt(-c^2*x^2 + 1
))/c^3
```

Sympy [A] time = 3.55446, size = 126, normalized size = 1.2

$$\begin{cases} -\frac{ac^2dx^5}{5}+\frac{adx^3}{3}-\frac{bc^2dx^5\operatorname{asin}(cx)}{5}-\frac{bcdx^4\sqrt{-c^2x^2+1}}{25}+\frac{bdx^3\operatorname{asin}(cx)}{3}+\frac{13bdx^2\sqrt{-c^2x^2+1}}{225c}+\frac{26bd\sqrt{-c^2x^2+1}}{225c^3} & \text{for } c\neq 0 \\ \frac{adx^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**5/5 + a*d*x**3/3 - b*c**2*d*x**5*asin(c*x)/5 - b*c*
d*x**4*sqrt(-c**2*x**2 + 1)/25 + b*d*x**3*asin(c*x)/3 + 13*b*d*x**2*sqrt(-c
**2*x**2 + 1)/(225*c) + 26*b*d*sqrt(-c**2*x**2 + 1)/(225*c**3), Ne(c, 0)),
(a*d*x**3/3, True))
```

Giac [A] time = 1.35016, size = 192, normalized size = 1.83

$$-\frac{1}{5}\,ac^2dx^5+\frac{1}{3}\,adx^3-\frac{\left(c^2x^2-1\right)^2bdx\arcsin\left(cx\right)}{5\,c^2}-\frac{\left(c^2x^2-1\right)bdx\arcsin\left(cx\right)}{15\,c^2}+\frac{2\,bdx\arcsin\left(cx\right)}{15\,c^2}-\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\ldots}{25\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/5*a*c^2*d*x^5 + 1/3*a*d*x^3 - 1/5*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^2
- 1/15*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^2 + 2/15*b*d*x*arcsin(c*x)/c^2 - 1
/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^3 + 1/45*(-c^2*x^2 + 1)^(3/2)*
b*d/c^3 + 2/15*sqrt(-c^2*x^2 + 1)*b*d/c^3
```

3.4 $\int x\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=90

$$-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4c^2}+\frac{bdx\left(1-c^2x^2\right)^{3/2}}{16c}+\frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{3bd\sin^{-1}(cx)}{32c^2}$$

```
[Out] (3*b*d*x*Sqrt[1 - c^2*x^2])/(32*c) + (b*d*x*(1 - c^2*x^2)^(3/2))/(16*c) + (
3*b*d*ArcSin[c*x])/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(4*c^
2)
```

Rubi [A] time = 0.041917, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4677, 195, 216}

$$-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4c^2}+\frac{bdx\left(1-c^2x^2\right)^{3/2}}{16c}+\frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{3bd\sin^{-1}(cx)}{32c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*x*Sqrt[1 - c^2*x^2])/(32*c) + (b*d*x*(1 - c^2*x^2)^(3/2))/(16*c) + (
3*b*d*ArcSin[c*x])/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(4*c^
2)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4c^2}+\frac{(bd)\int\left(1-c^2x^2\right)^{3/2}\,dx}{4c}$$
$$=\frac{bdx\left(1-c^2x^2\right)^{3/2}}{16c}-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4c^2}+\frac{(3bd)\int\sqrt{1-c^2x^2}\,dx}{16c}$$
$$=\frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{bdx\left(1-c^2x^2\right)^{3/2}}{16c}-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4c^2}+\frac{(3bd)\int}{}$$
$$=\frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{bdx\left(1-c^2x^2\right)^{3/2}}{16c}+\frac{3bd\sin^{-1}(cx)}{32c^2}-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}\right.}{4c^2}$$

Mathematica [A] time = 0.0864117, size = 77, normalized size = 0.86

$$-\frac{d\left(cx\left(8acx\left(c^2x^2-2\right)+b\sqrt{1-c^2x^2}\left(2c^2x^2-5\right)\right)+b\left(8c^4x^4-16c^2x^2+5\right)\sin^{-1}(cx)\right)}{32c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(d*(c*x*(8*a*c*x*(-2 + c^2*x^2) + b*Sqrt[1 - c^2*x^2]*(-5 + 2*c^2*x^2)) +
b*(5 - 16*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]))/(32*c^2)
```

Maple [A] time = 0.004, size = 98, normalized size = 1.1

$$\frac{1}{c^2}\left(-da\left(\frac{c^4x^4}{4}-\frac{c^2x^2}{2}\right)-db\left(\frac{c^4x^4\arcsin(cx)}{4}-\frac{c^2x^2\arcsin(cx)}{2}+\frac{c^3x^3}{16}\sqrt{-c^2x^2+1}-\frac{5\,cx}{32}\sqrt{-c^2x^2+1}+\frac{5\arcsin(cx}{32}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^2*(-d*a*(1/4*c^4*x^4-1/2*c^2*x^2)-d*b*(1/4*c^4*x^4*arcsin(c*x)-1/2*c^2*
x^2*arcsin(c*x)+1/16*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/32*c*x*(-c^2*x^2+1)^(1/2)
+5/32*arcsin(c*x)))
```

Maxima [A] time = 1.58258, size = 205, normalized size = 2.28

$$-\frac{1}{4}ac^2dx^4-\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^4}\right)c\right)bc^2d+\frac{1}{2}adx^2+\frac{1}{4}\left(2x^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/4*a*c^2*d*x^4 - 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2
+ 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c
)*b*c^2*d + 1/2*a*d*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/
c^2 - arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^2)))*b*d
```

Fricas [A] time = 2.17125, size = 200, normalized size = 2.22

$$-\frac{8\,ac^4dx^4 - 16\,ac^2dx^2 + \left(8\,bc^4dx^4 - 16\,bc^2dx^2 + 5\,bd\right)\arcsin\left(cx\right) + \left(2\,bc^3dx^3 - 5\,bcdx\right)\sqrt{-c^2x^2 + 1}}{32\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/32*(8*a*c^4*d*x^4 - 16*a*c^2*d*x^2 + (8*b*c^4*d*x^4 - 16*b*c^2*d*x^2 + 5
*b*d)*arcsin(c*x) + (2*b*c^3*d*x^3 - 5*b*c*d*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] time = 7.07325, size = 117, normalized size = 1.3

$$\begin{cases} -\frac{ac^2dx^4}{4} + \frac{adx^2}{2} - \frac{bc^2dx^4\operatorname{asin}(cx)}{4} - \frac{bcdx^3\sqrt{-c^2x^2+1}}{16} + \frac{bdx^2\operatorname{asin}(cx)}{2} + \frac{5bdx\sqrt{-c^2x^2+1}}{32c} - \frac{5bd\operatorname{asin}(cx)}{32c^2} & \text{for}\: c \neq 0 \\ \frac{adx^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**4/4 + a*d*x**2/2 - b*c**2*d*x**4*asin(c*x)/4 - b*c*
d*x**3*sqrt(-c**2*x**2 + 1)/16 + b*d*x**2*asin(c*x)/2 + 5*b*d*x*sqrt(-c**2*
x**2 + 1)/(32*c) - 5*b*d*asin(c*x)/(32*c**2), Ne(c, 0)), (a*d*x**2/2, True)
)
```

Giac [A] time = 1.35259, size = 124, normalized size = 1.38

$$\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bdx}{16\,c} - \frac{\left(c^2x^2-1\right)^2 bd\arcsin\left(cx\right)}{4\,c^2} + \frac{3\,\sqrt{-c^2x^2+1}bdx}{32\,c} - \frac{\left(c^2x^2-1\right)^2 ad}{4\,c^2} + \frac{3\,bd\arcsin\left(cx\right)}{32\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*x/c - 1/4*(c^2*x^2 - 1)^2*b*d*arcsin(c*x)/c^2
 + 3/32*sqrt(-c^2*x^2 + 1)*b*d*x/c - 1/4*(c^2*x^2 - 1)^2*a*d/c^2 + 3/32*b*d
*arcsin(c*x)/c^2
```

3.5 $\int \left(d-c^2 d x^2\right) \left(a+b \sin^{-1}(c x)\right) \, dx$

Optimal. Leaf size=77

$$-\frac{1}{3} c^2 d x^3 \left(a+b \sin^{-1}(c x)\right)+d x \left(a+b \sin^{-1}(c x)\right)+\frac{b d \left(1-c^2 x^2\right)^{3/2}}{9 c}+\frac{2 b d \sqrt{1-c^2 x^2}}{3 c}$$

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(3*c) + (b*d*(1 - c^2*x^2)^(3/2))/(9*c) + d*x*(a
+ b*ArcSin[c*x]) - (c^2*d*x^3*(a + b*ArcSin[c*x]))/3
```

Rubi [A] time = 0.0609626, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4645, 12, 444, 43}

$$-\frac{1}{3} c^2 d x^3 \left(a+b \sin^{-1}(c x)\right)+d x \left(a+b \sin^{-1}(c x)\right)+\frac{b d \left(1-c^2 x^2\right)^{3/2}}{9 c}+\frac{2 b d \sqrt{1-c^2 x^2}}{3 c}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(3*c) + (b*d*(1 - c^2*x^2)^(3/2))/(9*c) + d*x*(a
+ b*ArcSin[c*x]) - (c^2*d*x^3*(a + b*ArcSin[c*x]))/3
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx = dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-(bc)\int \frac{dx\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx$$
$$= dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-(bcd)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx$$
$$= dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bcd)\,\text{Subst}\left(\int \frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,\right.$$
$$= dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bcd)\,\text{Subst}\left(\int \left(\frac{2}{3\sqrt{1-c^2x}}+\right.\right.$$
$$= \frac{2bd\sqrt{1-c^2x^2}}{3c}+\frac{bd\left(1-c^2x^2\right)^{3/2}}{9c}+dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)$$

Mathematica [A] time = 0.0692109, size = 88, normalized size = 1.14

$$-\frac{1}{3}ac^2dx^3+adx-\frac{1}{9}bcdx^2\sqrt{1-c^2x^2}+\frac{7bd\sqrt{1-c^2x^2}}{9c}-\frac{1}{3}bc^2dx^3\sin^{-1}(cx)+bdx\sin^{-1}(cx)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] a*d*x - (a*c^2*d*x^3)/3 + (7*b*d*Sqrt[1 - c^2*x^2])/(9*c) - (b*c*d*x^2*Sqrt
[1 - c^2*x^2])/9 + b*d*x*ArcSin[c*x] - (b*c^2*d*x^3*ArcSin[c*x])/3
```

Maple [A] time = 0.006, size = 82, normalized size = 1.1

$$\frac{1}{c}\left(-da\left(\frac{c^3x^3}{3}-cx\right)-db\left(\frac{c^3x^3\arcsin(cx)}{3}-cx\arcsin(cx)+\frac{c^2x^2}{9}\sqrt{-c^2x^2+1}-\frac{7}{9}\sqrt{-c^2x^2+1}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(-d*a*(1/3*c^3*x^3-c*x)-d*b*(1/3*c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)+1/
9*c^2*x^2*(-c^2*x^2+1)^(1/2)-7/9*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.68806, size = 131, normalized size = 1.7

$$-\frac{1}{3}ac^2dx^3-\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^2d+adx+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bd}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/3*a*c^2*d*x^3 - 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d + a*d*x + (c*x*arcsin(c*x) + sqrt(-c^2*
```

```
x^2 + 1))*b*d/c
```

Fricas [A] time = 2.16592, size = 163, normalized size = 2.12

$$-\frac{3\,ac^3dx^3 - 9\,acdx + 3\left(bc^3dx^3 - 3\,bcdx\right)\arcsin\left(cx\right) + \left(bc^2dx^2 - 7\,bd\right)\sqrt{-c^2x^2+1}}{9\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/9*(3*a*c^3*d*x^3 - 9*a*c*d*x + 3*(b*c^3*d*x^3 - 3*b*c*d*x)*arcsin(c*x) +
 (b*c^2*d*x^2 - 7*b*d)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] time = 3.52337, size = 90, normalized size = 1.17

$$\begin{cases} -\frac{ac^2dx^3}{3} + adx - \frac{bc^2dx^3\operatorname{asin}\left(cx\right)}{3} - \frac{bcdx^2\sqrt{-c^2x^2+1}}{9} + bdx\operatorname{asin}\left(cx\right) + \frac{7bd\sqrt{-c^2x^2+1}}{9c} & \text{for}\: c \neq 0 \\ adx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**3/3 + a*d*x - b*c**2*d*x**3*asin(c*x)/3 - b*c*d*x**
2*sqrt(-c**2*x**2 + 1)/9 + b*d*x*asin(c*x) + 7*b*d*sqrt(-c**2*x**2 + 1)/(9*
c), Ne(c, 0)), (a*d*x, True))
```

Giac [A] time = 1.32507, size = 108, normalized size = 1.4

$$-\frac{1}{3}\,ac^2dx^3 - \frac{1}{3}\left(c^2x^2 - 1\right)bdx\arcsin\left(cx\right) + \frac{2}{3}\,bdx\arcsin\left(cx\right) + adx + \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bd}{9\,c} + \frac{2\,\sqrt{-c^2x^2+1}bd}{3\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/3*a*c^2*d*x^3 - 1/3*(c^2*x^2 - 1)*b*d*x*arcsin(c*x) + 2/3*b*d*x*arcsin(c
*x) + a*d*x + 1/9*(-c^2*x^2 + 1)^(3/2)*b*d/c + 2/3*sqrt(-c^2*x^2 + 1)*b*d/c
```

3.6 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=121

$$-\frac{1}{2}ibd\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id\left(a+b\sin^{-1}(cx)\right)^2}{2b}+d\log\left(1-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin$$

```
[Out] -(b*c*d*x*Sqrt[1 - c^2*x^2])/4 - (b*d*ArcSin[c*x])/4 + (d*(1 - c^2*x^2)*(a
+ b*ArcSin[c*x]))/2 - ((I/2)*d*(a + b*ArcSin[c*x])^2)/b + d*(a + b*ArcSin[c
*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d*PolyLog[2, E^((2*I)*ArcSin[
c*x])]
```

Rubi [A] time = 0.116377, antiderivative size = 121, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4683, 4625, 3717, 2190, 2279, 2391, 195, 216}

$$-\frac{1}{2}ibd\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id\left(a+b\sin^{-1}(cx)\right)^2}{2b}+d\log\left(1-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -(b*c*d*x*Sqrt[1 - c^2*x^2])/4 - (b*d*ArcSin[c*x])/4 + (d*(1 - c^2*x^2)*(a
+ b*ArcSin[c*x]))/2 - ((I/2)*d*(a + b*ArcSin[c*x])^2)/b + d*(a + b*ArcSin[c
*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d*PolyLog[2, E^((2*I)*ArcSin[
c*x])]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = \frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)+d\int \frac{a+b\sin^{-1}(cx)}{x}\,dx-\frac{1}{2}(bcd)\int \sqrt{1-c^2x^2}\ldots$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)+d\,\mathrm{Subst}\left(\int (a+bx)\cot(\ldots\right.$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id\left(a+b\ldots\right.}{\ldots}$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id\left(a+b\ldots\right.}{\ldots}$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id\left(a+b\ldots\right.}{\ldots}$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id\left(a+b\ldots\right.}{\ldots}$$

Mathematica [A] time = 0.118707, size = 99, normalized size = 0.82

$$-\frac{1}{4}d\left(2ib\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+2ac^2x^2-4a\log(x)+bcx\sqrt{1-c^2x^2}+b\sin^{-1}(cx)\left(2c^2x^2-4\log\left(1-e^{2i\sin^{-1}(cx)}\right)-\ldots\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -(d*(2*a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2] + (2*I)*b*ArcSin[c*x]^2 + b*ArcS
in[c*x]*(-1 + 2*c^2*x^2 - 4*Log[1 - E^((2*I)*ArcSin[c*x])]) - 4*a*Log[x] +
(2*I)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/4
```

Maple [A] time = 0.158, size = 178, normalized size = 1.5

$$-\frac{dac^2x^2}{2}+da\ln(cx)-\frac{i}{2}bd(\arcsin(cx))^2-\frac{dbcx}{4}\sqrt{-c^2x^2+1}-\frac{db\arcsin(cx)c^2x^2}{2}+\frac{bd\arcsin(cx)}{4}+db\arcsin(cx)\ln\Big($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x)
```

```
[Out] -1/2*d*a*c^2*x^2+d*a*ln(c*x)-1/2*I*b*d*arcsin(c*x)^2-1/4*b*c*d*x*(-c^2*x^2+
1)^(1/2)-1/2*d*b*arcsin(c*x)*c^2*x^2+1/4*b*d*arcsin(c*x)+d*b*arcsin(c*x)*ln
(1-I*c*x-(-c^2*x^2+1)^(1/2))+d*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
-I*d*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d*b*polylog(2,I*c*x+(-c^2*x^2
+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}ac^2dx^2+ad\log(x)-\int\frac{\left(bc^2dx^2-bd\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] -1/2*a*c^2*d*x^2 + a*d*log(x) - integrate((b*c^2*d*x^2 - b*d)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{ac^2dx^2-ad+\left(bc^2dx^2-bd\right)\arcsin(cx)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int-\frac{a}{x}\,dx+\int ac^2x\,dx+\int-\frac{b\,\mathrm{asin}(cx)}{x}\,dx+\int bc^2x\,\mathrm{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x,x)
```

```
[Out] -d*(Integral(-a/x, x) + Integral(a*c**2*x, x) + Integral(-b*asin(c*x)/x, x)
 + Integral(b*c**2*x*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(c^2dx^2 - d)(b \arcsin(cx) + a)}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)/x, x)
```

3.7 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))}{x^2} dx$

Optimal. Leaf size=69

$$c^2(-d)x\left(a+b\sin^{-1}(cx)\right)-\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}-bcd\sqrt{1-c^2x^2}-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2]) - (d*(a + b*ArcSin[c*x]))/x - c^2*d*x*(a + b*Arc
Sin[c*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rubi [A] time = 0.0756378, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {14, 4687, 12, 446, 80, 63, 208}

$$c^2(-d)x\left(a+b\sin^{-1}(cx)\right)-\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}-bcd\sqrt{1-c^2x^2}-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2]) - (d*(a + b*ArcSin[c*x]))/x - c^2*d*x*(a + b*Arc
Sin[c*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
```

```
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{d\left(a+b\sin^{-1}(cx)\right)}{x} - c^2dx\left(a+b\sin^{-1}(cx)\right) - (bc)\int \frac{d\left(-1-c^2x^2\right)}{x\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{x} - c^2dx\left(a+b\sin^{-1}(cx)\right) - (bcd)\int \frac{-1-c^2x^2}{x\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{x} - c^2dx\left(a+b\sin^{-1}(cx)\right) - \frac{1}{2}(bcd)\,\text{Subst}\left(\int \frac{-1-c^2x}{x\sqrt{1-c^2x}}\,dx,\right.$$

$$= -bcd\sqrt{1-c^2x^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{x} - c^2dx\left(a+b\sin^{-1}(cx)\right) + \frac{1}{2}(bcd)\,\text{Subst}\Big($$

$$= -bcd\sqrt{1-c^2x^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{x} - c^2dx\left(a+b\sin^{-1}(cx)\right) - \frac{(bd)\,\text{Subst}\left(\int \ldots\right.}{\ldots}$$

$$= -bcd\sqrt{1-c^2x^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{x} - c^2dx\left(a+b\sin^{-1}(cx)\right) - bcd\tanh^{-1}\left(\sqrt{1\right.$$

Mathematica [A] time = 0.0355648, size = 78, normalized size = 1.13

$$-ac^2dx - \frac{ad}{x} - bcd\sqrt{1-c^2x^2} - bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right) - bc^2dx\sin^{-1}(cx) - \frac{bd\sin^{-1}(cx)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*d)/x) - a*c^2*d*x - b*c*d*Sqrt[1 - c^2*x^2] - (b*d*ArcSin[c*x])/x - b*
c^2*d*x*ArcSin[c*x] - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A] time = 0.007, size = 67, normalized size = 1.

$$c\left(-da\left(cx+\frac{1}{cx}\right)-db\left(cx\arcsin(cx)+\frac{\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}+\text{Artanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] c*(-d*a*(c*x+1/c/x)-d*b*(c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/
2)+arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.56601, size = 111, normalized size = 1.61

$$-ac^2dx - \left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bcd - \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bd - \frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -a*c^2*d*x - (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*c*d - (c*log(2*sqrt(-
c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d - a*d/x
```

Fricas [A] time = 2.56593, size = 236, normalized size = 3.42

$$-\frac{2\,ac^2dx^2 + bcdx\log\left(\sqrt{-c^2x^2+1}+1\right) - bcdx\log\left(\sqrt{-c^2x^2+1}-1\right) + 2\sqrt{-c^2x^2+1}bcdx + 2\,ad + 2\left(bc^2dx^2+bd\right)\arcsin}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a*c^2*d*x^2 + b*c*d*x*log(sqrt(-c^2*x^2 + 1) + 1) - b*c*d*x*log(sqr
t(-c^2*x^2 + 1) - 1) + 2*sqrt(-c^2*x^2 + 1)*b*c*d*x + 2*a*d + 2*(b*c^2*d*x^
2 + b*d)*arcsin(c*x))/x
```

Sympy [A] time = 5.35423, size = 82, normalized size = 1.19

$$-ac^2dx - \frac{ad}{x} - bc^2d\left(\begin{cases}0 & \text{for}\: c = 0\\x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right) + bcd\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\: \frac{1}{|c^2x^2|} > 1\\i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right) - \frac{bd\operatorname{asin}(cx)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*c**2*d*x - a*d/x - b*c**2*d*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt
(-c**2*x**2 + 1)/c, True)) + b*c*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x
**2) > 1), (I*asin(1/(c*x)), True)) - b*d*asin(c*x)/x
```

Giac [B] time = 6.15113, size = 1156, normalized size = 16.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^5*d*x^4*arcsin(c*x)/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sq
rt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/2*a*c^5*d*x^4/((c^3*
x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x
^2 + 1) + 1)^4) + b*c^4*d*x^3*log(abs(c)*abs(x))/((c^3*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - b*
c^4*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
+ c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) + b*c^4*d*x^3/(
(c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-
c^2*x^2 + 1) + 1)^3) - 3*b*c^3*d*x^2*arcsin(c*x)/((c^3*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 3*
a*c^3*d*x^2/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^2*d*x*log(abs(c)*abs(x))/((c^3*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)) - b*c^2*d*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^3*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c
^2*d*x/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d*arcsin(c*x)/(c^3*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*a*c*d/(c^3*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
```

3.8 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=139

$$\frac{1}{2}ibc^2d\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d\left(a+b\sin^{-1}(cx)\right)^2}{2b}-c^2d\log\left(1-e^{2i\sin^{-1}(cx)}\right)\left(a+b\right.$$

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(2*x) - (b*c^2*d*ArcSin[c*x])/2 - (d*(1 - c^2*x^
2)*(a + b*ArcSin[c*x]))/(2*x^2) + ((I/2)*c^2*d*(a + b*ArcSin[c*x])^2)/b - c
^2*d*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] + (I/2)*b*c^2*d*Pol
yLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.120644, antiderivative size = 139, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4685, 277, 216, 4625, 3717, 2190, 2279, 2391}

$$\frac{1}{2}ibc^2d\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d\left(a+b\sin^{-1}(cx)\right)^2}{2b}-c^2d\log\left(1-e^{2i\sin^{-1}(cx)}\right)\left(a+b\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(2*x) - (b*c^2*d*ArcSin[c*x])/2 - (d*(1 - c^2*x^
2)*(a + b*ArcSin[c*x]))/(2*x^2) + ((I/2)*c^2*d*(a + b*ArcSin[c*x])^2)/b - c
^2*d*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] + (I/2)*b*c^2*d*Pol
yLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 4685

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcSin[c*x
]))/(f*(m + 1)), x] + (-Dist[(b*c*d^p)/(f*(m + 1)), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx = -\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{1}{2}(bcd)\int \frac{\sqrt{1-c^2x^2}}{x^2}\,dx-\left(c^2d\right)\int \frac{a+b\sin^{-1}}{x}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}-\left(c^2d\right)\text{Subst}\left(\int (a+bx)\cot(x\right.$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}bc^2d\sin^{-1}(cx)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d\left(a+b\right.}{2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}bc^2d\sin^{-1}(cx)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d\left(a+b\right.}{2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}bc^2d\sin^{-1}(cx)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d\left(a+b\right.}{2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}bc^2d\sin^{-1}(cx)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d\left(a+b\right.}{2}$$

Mathematica [A] time = 0.105223, size = 110, normalized size = 0.79

$$-\frac{d\left(-ibc^2x^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+2ac^2x^2\log(x)+a+bcx\sqrt{1-c^2x^2}-ibc^2x^2\sin^{-1}(cx)^2+b\sin^{-1}(cx)\left(1+2c^2x^2\right.\right.}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(d*(a + b*c*x*Sqrt[1 - c^2*x^2] - I*b*c^2*x^2*ArcSin[c*x]^2 + b*ArcSin[c*x
]*(1 + 2*c^2*x^2*Log[1 - E^((2*I)*ArcSin[c*x])]) + 2*a*c^2*x^2*Log[x] - I*b
```

```
*c^2*x^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(2*x^2)
```

Maple [A] time = 0.23, size = 195, normalized size = 1.4

$$-\frac{da}{2\,x^{2}}-c^{2}da\ln\left(cx\right)+\frac{i}{2}c^{2}db\left(\arcsin\left(cx\right)\right)^{2}+\frac{i}{2}c^{2}db-\frac{bcd}{2\,x}\sqrt{-c^{2}x^{2}+1}-\frac{bd\arcsin\left(cx\right)}{2\,x^{2}}-c^{2}db\arcsin\left(cx\right)\ln\left(1+icx+\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] -1/2*d*a/x^2-c^2*d*a*ln(c*x)+1/2*I*c^2*d*b*arcsin(c*x)^2+1/2*I*c^2*d*b-1/2*
b*c*d*(-c^2*x^2+1)^(1/2)/x-1/2*d*b*arcsin(c*x)/x^2-c^2*d*b*arcsin(c*x)*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))-c^2*d*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))+I*c^2*d*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+I*c^2*d*b*polylog(2,I*c*x
+(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-bc^{2}d\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,dx-ac^{2}d\log\left(x\right)-\frac{1}{2}\,bd\left(\frac{\sqrt{-c^{2}x^{2}+1}c}{x}+\frac{\arcsin\left(cx\right)}{x^{2}}\right)-\frac{ad}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -b*c^2*d*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) - a*c^2
*d*log(x) - 1/2*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a*d/x^
2
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{ac^{2}dx^{2}-ad+\left(bc^{2}dx^{2}-bd\right)\arcsin\left(cx\right)}{x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int-\frac{a}{x^{3}}\,dx+\int\frac{ac^{2}}{x}\,dx+\int-\frac{b\,\mathrm{asin}\left(cx\right)}{x^{3}}\,dx+\int\frac{bc^{2}\,\mathrm{asin}\left(cx\right)}{x}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] -d*(Integral(-a/x**3, x) + Integral(a*c**2/x, x) + Integral(-b*asin(c*x)/x*
*3, x) + Integral(b*c**2*asin(c*x)/x, x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(c^2dx^2 - d)(b \arcsin(cx) + a)}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)/x^3, x)
```

3.9 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))}{x^4}\,dx$

Optimal. Leaf size=81

$$\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}+\frac{5}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (d*(a + b*ArcSin[c*x]))/(3*x^3) + (c^2
*d*(a + b*ArcSin[c*x]))/x + (5*b*c^3*d*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rubi [A] time = 0.086358, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {14, 4687, 12, 446, 78, 63, 208}

$$\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}+\frac{5}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (d*(a + b*ArcSin[c*x]))/(3*x^3) + (c^2
*d*(a + b*ArcSin[c*x]))/x + (5*b*c^3*d*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
```

```
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx &= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}-(bc)\int \frac{d\left(-1+3c^2x^2\right)}{3x^3\sqrt{1-c^2x^2}}\,dx\\ &= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{3}(bcd)\int \frac{-1+3c^2x^2}{x^3\sqrt{1-c^2x^2}}\,dx\\ &= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{6}(bcd)\,\text{Subst}\left(\int \frac{-1+3c^2x}{x^2\sqrt{1-c^2x}}\,dx\right.\\ &= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{12}\left(5bc^3d\right)\text{Subs}\\ &= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{1}{6}(5bcd)\,\text{Subst}\\ &= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{c^2d\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{5}{6}bc^3d\tanh^{-1}\left(\right.\end{aligned}$$

Mathematica [A] time = 0.0395833, size = 93, normalized size = 1.15

$$\frac{ac^2d}{x}-\frac{ad}{3x^3}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}+\frac{5}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{bc^2d\sin^{-1}(cx)}{x}-\frac{bd\sin^{-1}(cx)}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -(a*d)/(3*x^3) + (a*c^2*d)/x - (b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (b*d*Arc
Sin[c*x])/(3*x^3) + (b*c^2*d*ArcSin[c*x])/x + (5*b*c^3*d*ArcTanh[Sqrt[1 - c
^2*x^2]])/6
```

Maple [A] time = 0.011, size = 91, normalized size = 1.1

$$c^3\left(-da\left(-\frac{1}{cx}+\frac{1}{3\,c^3x^3}\right)-db\left(-\frac{\arcsin(cx)}{cx}+\frac{\arcsin(cx)}{3\,c^3x^3}+\frac{1}{6\,c^2x^2}\sqrt{-c^2x^2+1}-\frac{5}{6}\text{Artanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] c^3*(-d*a*(-1/c/x+1/3/c^3/x^3)-d*b*(-1/c/x*arcsin(c*x)+1/3/c^3/x^3*arcsin(c
*x)+1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)-5/6*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.60712, size = 166, normalized size = 2.05

$$\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bc^2d-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*c^2*d - 1
/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x
^2)*c + 2*arcsin(c*x)/x^3)*b*d + a*c^2*d/x - 1/3*a*d/x^3
```

Fricas [A] time = 2.95843, size = 259, normalized size = 3.2

$$\frac{5\,bc^3dx^3\log\left(\sqrt{-c^2x^2+1}+1\right)-5\,bc^3dx^3\log\left(\sqrt{-c^2x^2+1}-1\right)+12\,ac^2dx^2-2\sqrt{-c^2x^2+1}bcdx-4\,ad+4\left(3\,bc^2dx^2-bd\right.}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(5*b*c^3*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - 5*b*c^3*d*x^3*log(sqrt(-c
^2*x^2 + 1) - 1) + 12*a*c^2*d*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*c*d*x - 4*a*d +
4*(3*b*c^2*d*x^2 - b*d)*arcsin(c*x))/x^3
```

Sympy [A] time = 7.58766, size = 178, normalized size = 2.2

$$\frac{ac^2d}{x}-\frac{ad}{3x^3}-bc^3d\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)+\frac{bc^2d\operatorname{asin}(cx)}{x}+\frac{bcd\left(\begin{cases}-\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2}-\frac{c\sqrt{-1+\frac{1}{c^2x^2}}}{2x} & \text{for}\ \ldots\\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2}-\frac{ic}{2x\sqrt{1-\frac{1}{c^2x^2}}}+\frac{i}{2cx^3\sqrt{1-\frac{1}{c^2x^2}}} & \text{othe}\ldots\end{cases}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] a*c**2*d/x - a*d/(3*x**3) - b*c**3*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2
*x**2) > 1), (I*asin(1/(c*x)), True)) + b*c**2*d*asin(c*x)/x + b*c*d*Piecew
ise((-c**2*acosh(1/(c*x))/2 - c*sqrt(-1 + 1/(c**2*x**2))/(2*x), 1/Abs(c**2*
x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c/(2*x*sqrt(1 - 1/(c**2*x**2))) + I
/(2*c*x**3*sqrt(1 - 1/(c**2*x**2))), True))/3 - b*d*asin(c*x)/(3*x**3)
```

Giac [B] time = 22.4812, size = 400, normalized size = 4.94

$$-\frac{bc^6dx^3 \arcsin(cx)}{24\left(\sqrt{-c^2x^2+1}+1\right)^3}-\frac{ac^6dx^3}{24\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{bc^5dx^2}{24\left(\sqrt{-c^2x^2+1}+1\right)^2}+\frac{3\,bc^4dx \arcsin(cx)}{8\left(\sqrt{-c^2x^2+1}+1\right)}+\frac{3\,ac^4dx}{8\left(\sqrt{-c^2x^2+1}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^6*d*x^3*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1)^3 - 1/24*a*c^6*d*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + 1/24*b*c^5*d*x^2/(sqrt(-c^2*x^2 + 1) + 1)^2 +
 3/8*b*c^4*d*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) + 3/8*a*c^4*d*x/(sqrt(-
c^2*x^2 + 1) + 1) - 5/6*b*c^3*d*log(abs(c)*abs(x)) + 5/6*b*c^3*d*log(sqrt(-
c^2*x^2 + 1) + 1) + 3/8*b*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x + 3/
8*a*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)/x - 1/24*b*c*d*(sqrt(-c^2*x^2 + 1) + 1)^
2/x^2 - 1/24*b*d*(sqrt(-c^2*x^2 + 1) + 1)^3*arcsin(c*x)/x^3 - 1/24*a*d*(sqr
t(-c^2*x^2 + 1) + 1)^3/x^3
```

3.10 $\int x^4 \left(d-c^2 d x^2\right)^2 \left(a+b \sin^{-1}(cx)\right) \, dx$

Optimal. Leaf size=186

$$\frac{1}{9}c^4 d^2 x^9 \left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2 d^2 x^7 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}d^2 x^5 \left(a+b\sin^{-1}(cx)\right)+\frac{bd^2\left(1-c^2x^2\right)^{9/2}}{81c^5}-\frac{10bd^2\left(1-c^2x^2\right)^{7/2}}{441c^5}$$

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(315*c^5) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(945*
c^5) + (b*d^2*(1 - c^2*x^2)^(5/2))/(525*c^5) - (10*b*d^2*(1 - c^2*x^2)^(7/2
))/(441*c^5) + (b*d^2*(1 - c^2*x^2)^(9/2))/(81*c^5) + (d^2*x^5*(a + b*ArcSi
n[c*x]))/5 - (2*c^2*d^2*x^7*(a + b*ArcSin[c*x]))/7 + (c^4*d^2*x^9*(a + b*Ar
cSin[c*x]))/9
```

Rubi [A] time = 0.206582, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {270, 4687, 12, 1251, 897, 1153}

$$\frac{1}{9}c^4 d^2 x^9 \left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2 d^2 x^7 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}d^2 x^5 \left(a+b\sin^{-1}(cx)\right)+\frac{bd^2\left(1-c^2x^2\right)^{9/2}}{81c^5}-\frac{10bd^2\left(1-c^2x^2\right)^{7/2}}{441c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```


```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(315*c^5) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(945*
c^5) + (b*d^2*(1 - c^2*x^2)^(5/2))/(525*c^5) - (10*b*d^2*(1 - c^2*x^2)^(7/2
))/(441*c^5) + (b*d^2*(1 - c^2*x^2)^(9/2))/(81*c^5) + (d^2*x^5*(a + b*ArcSi
n[c*x]))/5 - (2*c^2*d^2*x^7*(a + b*ArcSin[c*x]))/7 + (c^4*d^2*x^9*(a + b*Ar
cSin[c*x]))/9
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rubi steps

$$\int x^4 \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+b\sin^{-1}(\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+b\sin^{-1}(\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+b\sin^{-1}(\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+b\sin^{-1}(\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+b\sin^{-1}(\right.$$

$$=\frac{8bd^2\sqrt{1-c^2x^2}}{315c^5}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{945c^5}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{525c^5}-\frac{10bd^2\left(1-c^2x^2\right)^{7/}}{441c^5}$$

Mathematica [A] time = 0.107498, size = 119, normalized size = 0.64

$$\frac{d^2\left(315ac^5x^5\left(35c^4x^4-90c^2x^2+63\right)+b\sqrt{1-c^2x^2}\left(1225c^8x^8-2650c^6x^6+789c^4x^4+1052c^2x^2+2104\right)+315bc^5x^5\left(\right.}{99225c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(315*a*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(2
104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^8) + 315*b*c^5
*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4)*ArcSin[c*x]))/(99225*c^5)
```

Maple [A] time = 0.01, size = 172, normalized size = 0.9

$$\frac{1}{c^5}\left(d^2a\left(\frac{c^9x^9}{9}-\frac{2c^7x^7}{7}+\frac{c^5x^5}{5}\right)+d^2b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{2\arcsin(cx)c^7x^7}{7}+\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^8x^8}{81}\sqrt{-c^2x^2+1}-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^5*(d^2*a*(1/9*c^9*x^9-2/7*c^7*x^7+1/5*c^5*x^5)+d^2*b*(1/9*arcsin(c*x)*c
^9*x^9-2/7*arcsin(c*x)*c^7*x^7+1/5*arcsin(c*x)*c^5*x^5+1/81*c^8*x^8*(-c^2*x
^2+1)^(1/2)-106/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+263/33075*c^4*x^4*(-c^2*x^2
+1)^(1/2)+1052/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)+2104/99225*(-c^2*x^2+1)^(1/
2)))
```

Maxima [B] time = 1.57597, size = 443, normalized size = 2.38

$$\frac{1}{9}ac^4d^2x^9 - \frac{2}{7}ac^2d^2x^7 + \frac{1}{2835}\left(315\,x^9\arcsin(cx) + \left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2} + \frac{40\sqrt{-c^2x^2+1}x^6}{c^4} + \frac{48\sqrt{-c^2x^2+1}x^4}{c^6} + \frac{64\sqrt{-c}\cdots}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*c^4*d^2*x^9 - 2/7*a*c^2*d^2*x^7 + 1/2835*(315*x^9*arcsin(c*x) + (35*s
qrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^
2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^1
0)*c)*b*c^4*d^2 + 1/5*a*d^2*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*
x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/
c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^2*d^2 + 1/75*(15*x^5*arcsin(c*x) +
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c)*b*d^2
```

Fricas [A] time = 2.56715, size = 366, normalized size = 1.97

$$\frac{11025\,ac^9d^2x^9 - 28350\,ac^7d^2x^7 + 19845\,ac^5d^2x^5 + 315\left(35\,bc^9d^2x^9 - 90\,bc^7d^2x^7 + 63\,bc^5d^2x^5\right)\arcsin(cx) + \left(1225\,bc^8d^2x\cdots\right.}{99225\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*d^2*x^9 - 28350*a*c^7*d^2*x^7 + 19845*a*c^5*d^2*x^5 +
315*(35*b*c^9*d^2*x^9 - 90*b*c^7*d^2*x^7 + 63*b*c^5*d^2*x^5)*arcsin(c*x) +
(1225*b*c^8*d^2*x^8 - 2650*b*c^6*d^2*x^6 + 789*b*c^4*d^2*x^4 + 1052*b*c^2*d
^2*x^2 + 2104*b*d^2)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 34.0927, size = 230, normalized size = 1.24

$$\begin{cases} \frac{ac^4d^2x^9}{9} - \frac{2ac^2d^2x^7}{7} + \frac{ad^2x^5}{5} + \frac{bc^4d^2x^9\operatorname{asin}(cx)}{9} + \frac{bc^3d^2x^8\sqrt{-c^2x^2+1}}{81} - \frac{2bc^2d^2x^7\operatorname{asin}(cx)}{7} - \frac{106bcd^2x^6\sqrt{-c^2x^2+1}}{3969} + \frac{bd^2x^5\operatorname{asin}(cx)}{5} + \frac{263bd^2x^4\sqrt{-\cdots}}{3307\cdots} \\ \frac{ad^2x^5}{5} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**9/9 - 2*a*c**2*d**2*x**7/7 + a*d**2*x**5/5 + b*c*
*4*d**2*x**9*asin(c*x)/9 + b*c**3*d**2*x**8*sqrt(-c**2*x**2 + 1)/81 - 2*b*c
```

```
**2*d**2*x**7*asin(c*x)/7 - 106*b*c*d**2*x**6*sqrt(-c**2*x**2 + 1)/3969 + b
*d**2*x**5*asin(c*x)/5 + 263*b*d**2*x**4*sqrt(-c**2*x**2 + 1)/(33075*c) + 1
052*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(99225*c**3) + 2104*b*d**2*sqrt(-c**2*
x**2 + 1)/(99225*c**5), Ne(c, 0)), (a*d**2*x**5/5, True))
```

Giac [A] time = 1.30353, size = 383, normalized size = 2.06

$$\frac{1}{9}\,ac^4d^2x^9-\frac{2}{7}\,ac^2d^2x^7+\frac{1}{5}\,ad^2x^5+\frac{\left(c^2x^2-1\right)^4bd^2x\arcsin\left(cx\right)}{9\,c^4}+\frac{10\left(c^2x^2-1\right)^3bd^2x\arcsin\left(cx\right)}{63\,c^4}+\frac{\left(c^2x^2-1\right)^2bd^2x\,\mathrm{ar}}{105\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*c^4*d^2*x^9 - 2/7*a*c^2*d^2*x^7 + 1/5*a*d^2*x^5 + 1/9*(c^2*x^2 - 1)^4
*b*d^2*x*arcsin(c*x)/c^4 + 10/63*(c^2*x^2 - 1)^3*b*d^2*x*arcsin(c*x)/c^4 +
1/105*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(c*x)/c^4 + 1/81*(c^2*x^2 - 1)^4*sqrt(-
c^2*x^2 + 1)*b*d^2/c^5 - 4/315*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^4 + 10/4
41*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 8/315*b*d^2*x*arcsin(c*x)
/c^4 + 1/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 4/945*(-c^2*x^2
 + 1)^(3/2)*b*d^2/c^5 + 8/315*sqrt(-c^2*x^2 + 1)*b*d^2/c^5
```

3.11 $\int x^3 \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=184

$$\frac{1}{8}c^4d^2x^8\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}-\frac{43bcd^2x^5\sqrt{1-}}{1152}$$

```
[Out] (73*b*d^2*x*Sqrt[1 - c^2*x^2])/(3072*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]
)/(4608*c) - (43*b*c*d^2*x^5*Sqrt[1 - c^2*x^2])/1152 + (b*c^3*d^2*x^7*Sqrt[
1 - c^2*x^2])/64 - (73*b*d^2*ArcSin[c*x])/(3072*c^4) + (d^2*x^4*(a + b*ArcS
in[c*x]))/4 - (c^2*d^2*x^6*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^8*(a + b*Arc
Sin[c*x]))/8
```

Rubi [A] time = 0.169913, antiderivative size = 184, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 4687, 12, 1267, 459, 321, 216}

$$\frac{1}{8}c^4d^2x^8\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}-\frac{43bcd^2x^5\sqrt{1-}}{1152}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```


```
[Out] (73*b*d^2*x*Sqrt[1 - c^2*x^2])/(3072*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]
)/(4608*c) - (43*b*c*d^2*x^5*Sqrt[1 - c^2*x^2])/1152 + (b*c^3*d^2*x^7*Sqrt[
1 - c^2*x^2])/64 - (73*b*d^2*ArcSin[c*x])/(3072*c^4) + (d^2*x^4*(a + b*ArcS
in[c*x]))/4 - (c^2*d^2*x^6*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^8*(a + b*Arc
Sin[c*x]))/8
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1267

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[(c^p*(f*x)^(m + 4*p - 1)*(d + e*x^2)^
(q + 1))/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1)), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}c^4d^2x^8\left(a+b\sin^{-1}(\right.$$

$$=\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}c^4d^2x^8\left(a+b\sin^{-1}(\right.$$

$$=\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6\left(a+b\sin^{-1}(cx)\right)$$

$$=-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c$$

$$=\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}+\frac{1}{4}d^2x^4\left(a\right.$$

$$=\frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3}+\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{}$$

$$=\frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3}+\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{}$$

Mathematica [A] time = 0.0998687, size = 115, normalized size = 0.62

$$\frac{d^2\left(384ac^4x^4\left(3c^4x^4-8c^2x^2+6\right)+bcx\sqrt{1-c^2x^2}\left(144c^6x^6-344c^4x^4+146c^2x^2+219\right)+3b\left(384c^8x^8-1024c^6x^6+7\right.\right.}{9216c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(384*a*c^4*x^4*(6 - 8*c^2*x^2 + 3*c^4*x^4) + b*c*x*Sqrt[1 - c^2*x^2]*(
219 + 146*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6) + 3*b*(-73 + 768*c^4*x^4 - 1
024*c^6*x^6 + 384*c^8*x^8)*ArcSin[c*x]))/(9216*c^4)
```

Maple [A] time = 0.007, size = 160, normalized size = 0.9

$$\frac{1}{c^4}\left(d^2a\left(\frac{c^8x^8}{8}-\frac{c^6x^6}{3}+\frac{c^4x^4}{4}\right)+d^2b\left(\frac{\arcsin(cx)\,c^8x^8}{8}-\frac{\arcsin(cx)\,c^6x^6}{3}+\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^7x^7}{64}\sqrt{-c^2x^2+1}-\frac{43\,c^5x^5}{1152}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^4*(d^2*a*(1/8*c^8*x^8-1/3*c^6*x^6+1/4*c^4*x^4)+d^2*b*(1/8*arcsin(c*x)*c
^8*x^8-1/3*arcsin(c*x)*c^6*x^6+1/4*c^4*x^4*arcsin(c*x)+1/64*c^7*x^7*(-c^2*x
^2+1)^(1/2)-43/1152*c^5*x^5*(-c^2*x^2+1)^(1/2)+73/4608*c^3*x^3*(-c^2*x^2+1)
^(1/2)+73/3072*c*x*(-c^2*x^2+1)^(1/2)-73/3072*arcsin(c*x)))
```

Maxima [B] time = 1.58398, size = 451, normalized size = 2.45

$$\frac{1}{8}\,ac^4d^2x^8-\frac{1}{3}\,ac^2d^2x^6+\frac{1}{3072}\left(384\,x^8\arcsin(cx)+\left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2}+\frac{56\sqrt{-c^2x^2+1}x^5}{c^4}+\frac{70\sqrt{-c^2x^2+1}x^3}{c^6}+\frac{105\sqrt{}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*c^4*d^2*x^8 - 1/3*a*c^2*d^2*x^6 + 1/3072*(384*x^8*arcsin(c*x) + (48*s
qrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^
2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(c^2))
/(sqrt(c^2)*c^8))*c)*b*c^4*d^2 + 1/4*a*d^2*x^4 - 1/144*(48*x^6*arcsin(c*x)
+ (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-
c^2*x^2 + 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*c^2*d
^2 + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*
x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*d^2
```

Fricas [A] time = 2.53678, size = 351, normalized size = 1.91

$$\frac{1152\,ac^8d^2x^8-3072\,ac^6d^2x^6+2304\,ac^4d^2x^4+3\left(384\,bc^8d^2x^8-1024\,bc^6d^2x^6+768\,bc^4d^2x^4-73\,bd^2\right)\arcsin(cx)+\left(144\right.}{9216\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9216*(1152*a*c^8*d^2*x^8 - 3072*a*c^6*d^2*x^6 + 2304*a*c^4*d^2*x^4 + 3*(3
84*b*c^8*d^2*x^8 - 1024*b*c^6*d^2*x^6 + 768*b*c^4*d^2*x^4 - 73*b*d^2)*arcsi
```

```
n(c*x) + (144*b*c^7*d^2*x^7 - 344*b*c^5*d^2*x^5 + 146*b*c^3*d^2*x^3 + 219*b
*c*d^2*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A] time = 20.7344, size = 218, normalized size = 1.18

$$\begin{cases} \frac{ac^4d^2x^8}{8} - \frac{ac^2d^2x^6}{3} + \frac{ad^2x^4}{4} + \frac{bc^4d^2x^8 \operatorname{asin}(cx)}{8} + \frac{bc^3d^2x^7\sqrt{-c^2x^2+1}}{64} - \frac{bc^2d^2x^6 \operatorname{asin}(cx)}{3} - \frac{43bcd^2x^5\sqrt{-c^2x^2+1}}{1152} + \frac{bd^2x^4 \operatorname{asin}(cx)}{4} + \frac{73bd^2x^3\sqrt{-}}{4608} \\ \frac{ad^2x^4}{4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**8/8 - a*c**2*d**2*x**6/3 + a*d**2*x**4/4 + b*c**4
*d**2*x**8*asin(c*x)/8 + b*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)/64 - b*c**2*
d**2*x**6*asin(c*x)/3 - 43*b*c*d**2*x**5*sqrt(-c**2*x**2 + 1)/1152 + b*d**2
*x**4*asin(c*x)/4 + 73*b*d**2*x**3*sqrt(-c**2*x**2 + 1)/(4608*c) + 73*b*d**
2*x*sqrt(-c**2*x**2 + 1)/(3072*c**3) - 73*b*d**2*asin(c*x)/(3072*c**4), Ne(
c, 0)), (a*d**2*x**4/4, True))
```

Giac [A] time = 1.27356, size = 286, normalized size = 1.55

$$\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}bd^2x}{64\,c^3} + \frac{\left(c^2x^2-1\right)^4bd^2\arcsin(cx)}{8\,c^4} + \frac{11\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd^2x}{1152\,c^3} + \frac{\left(c^2x^2-1\right)^4ad^2}{8\,c^4} + \frac{\left(c^2x^2-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/64*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 1/8*(c^2*x^2 - 1)^4*b
*d^2*arcsin(c*x)/c^4 + 11/1152*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2*x/c
^3 + 1/8*(c^2*x^2 - 1)^4*a*d^2/c^4 + 1/6*(c^2*x^2 - 1)^3*b*d^2*arcsin(c*x)/
c^4 + 55/4608*(-c^2*x^2 + 1)^(3/2)*b*d^2*x/c^3 + 1/6*(c^2*x^2 - 1)^3*a*d^2/
c^4 + 55/3072*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 55/3072*b*d^2*arcsin(c*x)/c^
4
```

3.12 $\int x^2 \left(d-c^2 d x^2\right)^2 \left(a+b \sin^{-1}(cx)\right) dx$

Optimal. Leaf size=161

$$\frac{1}{7}c^4d^2x^7\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{bd^2\left(1-c^2x^2\right)^{7/2}}{49c^3}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{175c^3}+$$

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(105*c^3) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(315*
c^3) + (b*d^2*(1 - c^2*x^2)^(5/2))/(175*c^3) - (b*d^2*(1 - c^2*x^2)^(7/2))/
(49*c^3) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 - (2*c^2*d^2*x^5*(a + b*ArcSin[c
*x]))/5 + (c^4*d^2*x^7*(a + b*ArcSin[c*x]))/7
```

Rubi [A] time = 0.169966, antiderivative size = 161, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {270, 4687, 12, 1251, 771}

$$\frac{1}{7}c^4d^2x^7\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{bd^2\left(1-c^2x^2\right)^{7/2}}{49c^3}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{175c^3}+$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(105*c^3) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(315*
c^3) + (b*d^2*(1 - c^2*x^2)^(5/2))/(175*c^3) - (b*d^2*(1 - c^2*x^2)^(7/2))/
(49*c^3) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 - (2*c^2*d^2*x^5*(a + b*ArcSin[c
*x]))/5 + (c^4*d^2*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 771

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (
c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && NeQ[b^
2 - 4*a*c, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0] && IntegerQ[m]))
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+b\sin^{-1}(c\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+b\sin^{-1}(c\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+b\sin^{-1}(c\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+b\sin^{-1}(c\right.$$

$$=\frac{8bd^2\sqrt{1-c^2x^2}}{105c^3}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{315c^3}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{175c^3}-\frac{bd^2\left(1-c^2x^2\right)^{7/2}}{49c^3}-$$

Mathematica [A] time = 0.0922021, size = 111, normalized size = 0.69

$$\frac{d^2\left(105ac^3x^3\left(15c^4x^4-42c^2x^2+35\right)+b\sqrt{1-c^2x^2}\left(225c^6x^6-612c^4x^4+409c^2x^2+818\right)+105bc^3x^3\left(15c^4x^4-42c^2x^2\right.\right.}{11025c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(105*a*c^3*x^3*(35 - 42*c^2*x^2 + 15*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(8
18 + 409*c^2*x^2 - 612*c^4*x^4 + 225*c^6*x^6) + 105*b*c^3*x^3*(35 - 42*c^2*
x^2 + 15*c^4*x^4)*ArcSin[c*x]))/(11025*c^3)
```

Maple [A] time = 0.006, size = 152, normalized size = 0.9

$$\frac{1}{c^3}\left(d^2a\left(\frac{c^7x^7}{7}-\frac{2c^5x^5}{5}+\frac{c^3x^3}{3}\right)+d^2b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{2\arcsin(cx)c^5x^5}{5}+\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^6x^6}{49}\sqrt{-c^2x^2+1}-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^3*(d^2*a*(1/7*c^7*x^7-2/5*c^5*x^5+1/3*c^3*x^3)+d^2*b*(1/7*arcsin(c*x)*c
^7*x^7-2/5*arcsin(c*x)*c^5*x^5+1/3*c^3*x^3*arcsin(c*x)+1/49*c^6*x^6*(-c^2*x
^2+1)^(1/2)-68/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)+409/11025*c^2*x^2*(-c^2*x^2+
1)^(1/2)+818/11025*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.58702, size = 360, normalized size = 2.24

$$\frac{1}{7}ac^4d^2x^7-\frac{2}{5}ac^2d^2x^5+\frac{1}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x}}{c^8}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*c^4*d^2*x^7 - 2/5*a*c^2*d^2*x^5 + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt
(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1
)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^4*d^2 - 2/75*(15*x^5*arcsin(c
*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt
(-c^2*x^2 + 1)/c^6)*c)*b*c^2*d^2 + 1/3*a*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2
```

Fricas [A] time = 2.55373, size = 329, normalized size = 2.04

$$\frac{1575\,ac^7d^2x^7 - 4410\,ac^5d^2x^5 + 3675\,ac^3d^2x^3 + 105\left(15\,bc^7d^2x^7 - 42\,bc^5d^2x^5 + 35\,bc^3d^2x^3\right)\arcsin\left(cx\right) + \left(225\,bc^6d^2x^6 - 6\right.}{11025\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*(1575*a*c^7*d^2*x^7 - 4410*a*c^5*d^2*x^5 + 3675*a*c^3*d^2*x^3 + 105
*(15*b*c^7*d^2*x^7 - 42*b*c^5*d^2*x^5 + 35*b*c^3*d^2*x^3)*arcsin(c*x) + (22
5*b*c^6*d^2*x^6 - 612*b*c^4*d^2*x^4 + 409*b*c^2*d^2*x^2 + 818*b*d^2)*sqrt(-
c^2*x^2 + 1))/c^3
```

Sympy [A] time = 14.9122, size = 202, normalized size = 1.25

$$\begin{cases} \frac{ac^4d^2x^7}{7} - \frac{2ac^2d^2x^5}{5} + \frac{ad^2x^3}{3} + \frac{bc^4d^2x^7\operatorname{asin}(cx)}{7} + \frac{bc^3d^2x^6\sqrt{-c^2x^2+1}}{49} - \frac{2bc^2d^2x^5\operatorname{asin}(cx)}{5} - \frac{68bcd^2x^4\sqrt{-c^2x^2+1}}{1225} + \frac{bd^2x^3\operatorname{asin}(cx)}{3} + \frac{409bd^2x^2\sqrt{-c}}{11025c} \\ \frac{ad^2x^3}{3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**7/7 - 2*a*c**2*d**2*x**5/5 + a*d**2*x**3/3 + b*c*
*4*d**2*x**7*asin(c*x)/7 + b*c**3*d**2*x**6*sqrt(-c**2*x**2 + 1)/49 - 2*b*c
**2*d**2*x**5*asin(c*x)/5 - 68*b*c*d**2*x**4*sqrt(-c**2*x**2 + 1)/1225 + b*
d**2*x**3*asin(c*x)/3 + 409*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(11025*c) + 81
8*b*d**2*sqrt(-c**2*x**2 + 1)/(11025*c**3), Ne(c, 0)), (a*d**2*x**3/3, True
))
```

Giac [A] time = 1.30501, size = 306, normalized size = 1.9

$$\frac{1}{7}\,ac^4d^2x^7 - \frac{2}{5}\,ac^2d^2x^5 + \frac{1}{3}\,ad^2x^3 + \frac{\left(c^2x^2-1\right)^3bd^2x\arcsin\left(cx\right)}{7\,c^2} + \frac{\left(c^2x^2-1\right)^2bd^2x\arcsin\left(cx\right)}{35\,c^2} - \frac{4\left(c^2x^2-1\right)bd^2x\arcsin}{105\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*c^4*d^2*x^7 - 2/5*a*c^2*d^2*x^5 + 1/3*a*d^2*x^3 + 1/7*(c^2*x^2 - 1)^3
*b*d^2*x*arcsin(c*x)/c^2 + 1/35*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(c*x)/c^2 - 4
/105*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^2 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2
*x^2 + 1)*b*d^2/c^3 + 8/105*b*d^2*x*arcsin(c*x)/c^2 + 1/175*(c^2*x^2 - 1)^2
*sqrt(-c^2*x^2 + 1)*b*d^2/c^3 + 4/315*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^3 + 8/10
5*sqrt(-c^2*x^2 + 1)*b*d^2/c^3
```

3.13 $\int x \left(d-c^2 d x^2\right)^2 \left(a+b \sin^{-1}(cx)\right) dx$

Optimal. Leaf size=124

$$-\frac{d^2 \left(1-c^2x^2\right)^3 \left(a+b\sin^{-1}(cx)\right)}{6c^2}+\frac{bd^2x\left(1-c^2x^2\right)^{5/2}}{36c}+\frac{5bd^2x\left(1-c^2x^2\right)^{3/2}}{144c}+\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2\sin^{-1}(cx)}{96c^2}$$

```
[Out] (5*b*d^2*x*Sqrt[1 - c^2*x^2])/(96*c) + (5*b*d^2*x*(1 - c^2*x^2)^(3/2))/(144
*c) + (b*d^2*x*(1 - c^2*x^2)^(5/2))/(36*c) + (5*b*d^2*ArcSin[c*x])/(96*c^2)
 - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(6*c^2)
```

Rubi [A] time = 0.0653594, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {4677, 195, 216}

$$-\frac{d^2 \left(1-c^2x^2\right)^3 \left(a+b\sin^{-1}(cx)\right)}{6c^2}+\frac{bd^2x\left(1-c^2x^2\right)^{5/2}}{36c}+\frac{5bd^2x\left(1-c^2x^2\right)^{3/2}}{144c}+\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2\sin^{-1}(cx)}{96c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*d^2*x*Sqrt[1 - c^2*x^2])/(96*c) + (5*b*d^2*x*(1 - c^2*x^2)^(3/2))/(144
*c) + (b*d^2*x*(1 - c^2*x^2)^(5/2))/(36*c) + (5*b*d^2*ArcSin[c*x])/(96*c^2)
 - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(6*c^2)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)dx = -\frac{d^2\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6c^2} + \frac{\left(bd^2\right)\int\left(1-c^2x^2\right)^{5/2}dx}{6c}$$
$$= \frac{bd^2x\left(1-c^2x^2\right)^{5/2}}{36c} - \frac{d^2\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6c^2} + \frac{\left(5bd^2\right)\int\left(1-c^2x^2\right)^{3/2}}{36c}$$
$$= \frac{5bd^2x\left(1-c^2x^2\right)^{3/2}}{144c} + \frac{bd^2x\left(1-c^2x^2\right)^{5/2}}{36c} - \frac{d^2\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6c^2} +$$
$$= \frac{5bd^2x\sqrt{1-c^2x^2}}{96c} + \frac{5bd^2x\left(1-c^2x^2\right)^{3/2}}{144c} + \frac{bd^2x\left(1-c^2x^2\right)^{5/2}}{36c} - \frac{d^2\left(1-c^2x^2\right)^3(}{6}$$
$$= \frac{5bd^2x\sqrt{1-c^2x^2}}{96c} + \frac{5bd^2x\left(1-c^2x^2\right)^{3/2}}{144c} + \frac{bd^2x\left(1-c^2x^2\right)^{5/2}}{36c} + \frac{5bd^2\sin^{-1}(cx)}{96c^2}$$

Mathematica [A] time = 0.0644968, size = 94, normalized size = 0.76

$$\frac{d^2\left(48a\left(c^2x^2-1\right)^3+bcx\sqrt{1-c^2x^2}\left(8c^4x^4-26c^2x^2+33\right)+3b\left(16c^6x^6-48c^4x^4+48c^2x^2-11\right)\sin^{-1}(cx)\right)}{288c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(48*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*
c^4*x^4) + 3*b*(-11 + 48*c^2*x^2 - 48*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]))/(
288*c^2)
```

Maple [A] time = 0.006, size = 140, normalized size = 1.1

$$\frac{1}{c^2}\left(d^2a\left(\frac{c^6x^6}{6}-\frac{c^4x^4}{2}+\frac{c^2x^2}{2}\right)+d^2b\left(\frac{\arcsin(cx)\,c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{2}+\frac{c^2x^2\arcsin(cx)}{2}+\frac{c^5x^5}{36}\sqrt{-c^2x^2+1}-\frac{13\,c}{14}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^2*(d^2*a*(1/6*c^6*x^6-1/2*c^4*x^4+1/2*c^2*x^2)+d^2*b*(1/6*arcsin(c*x)*c
^6*x^6-1/2*c^4*x^4*arcsin(c*x)+1/2*c^2*x^2*arcsin(c*x)+1/36*c^5*x^5*(-c^2*x
^2+1)^(1/2)-13/144*c^3*x^3*(-c^2*x^2+1)^(1/2)+11/96*c*x*(-c^2*x^2+1)^(1/2)-
11/96*arcsin(c*x)))
```

Maxima [B] time = 1.69115, size = 369, normalized size = 2.98

$$\frac{1}{6}ac^4d^2x^6-\frac{1}{2}ac^2d^2x^4+\frac{1}{288}\left(48\,x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\,\mathrm{arcsi}}{\sqrt{c^2}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*c^4*d^2*x^6 - 1/2*a*c^2*d^2*x^4 + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt
(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 +
 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*c^4*d^2 - 1/16
*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*
x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*c^2*d^2 + 1/2*a*d^2
*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c^2*x/
sqrt(c^2))/(sqrt(c^2)*c^2)))*b*d^2
```

Fricas [A] time = 2.15539, size = 306, normalized size = 2.47

$$\frac{48\,ac^6d^2x^6 - 144\,ac^4d^2x^4 + 144\,ac^2d^2x^2 + 3\left(16\,bc^6d^2x^6 - 48\,bc^4d^2x^4 + 48\,bc^2d^2x^2 - 11\,bd^2\right)\arcsin\left(cx\right) + \left(8\,bc^5d^2x^5 - 2\right.}{288\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*d^2*x^6 - 144*a*c^4*d^2*x^4 + 144*a*c^2*d^2*x^2 + 3*(16*b*c
^6*d^2*x^6 - 48*b*c^4*d^2*x^4 + 48*b*c^2*d^2*x^2 - 11*b*d^2)*arcsin(c*x) +
(8*b*c^5*d^2*x^5 - 26*b*c^3*d^2*x^3 + 33*b*c*d^2*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] time = 7.70257, size = 190, normalized size = 1.53

$$\begin{cases} \frac{ac^4d^2x^6}{6} - \frac{ac^2d^2x^4}{2} + \frac{ad^2x^2}{2} + \frac{bc^4d^2x^6\operatorname{asin}(cx)}{6} + \frac{bc^3d^2x^5\sqrt{-c^2x^2+1}}{36} - \frac{bc^2d^2x^4\operatorname{asin}(cx)}{2} - \frac{13bcd^2x^3\sqrt{-c^2x^2+1}}{144} + \frac{bd^2x^2\operatorname{asin}(cx)}{2} + \frac{11bd^2x\sqrt{-c^2x^2}}{96c} \\ \frac{ad^2x^2}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**6/6 - a*c**2*d**2*x**4/2 + a*d**2*x**2/2 + b*c**4
*d**2*x**6*asin(c*x)/6 + b*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)/36 - b*c**2*
d**2*x**4*asin(c*x)/2 - 13*b*c*d**2*x**3*sqrt(-c**2*x**2 + 1)/144 + b*d**2*
x**2*asin(c*x)/2 + 11*b*d**2*x*sqrt(-c**2*x**2 + 1)/(96*c) - 11*b*d**2*asin
(c*x)/(96*c**2), Ne(c, 0)), (a*d**2*x**2/2, True))
```

Giac [A] time = 1.27394, size = 182, normalized size = 1.47

$$\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd^2x}{36\,c} + \frac{\left(c^2x^2-1\right)^3bd^2\arcsin\left(cx\right)}{6\,c^2} + \frac{5\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^2x}{144\,c} + \frac{\left(c^2x^2-1\right)^3ad^2}{6\,c^2} + \frac{5\sqrt{-c^2x^2+1}bd^2x}{96\,c} +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2*x/c + 1/6*(c^2*x^2 - 1)^3*b*d
^2*arcsin(c*x)/c^2 + 5/144*(-c^2*x^2 + 1)^(3/2)*b*d^2*x/c + 1/6*(c^2*x^2 -
1)^3*a*d^2/c^2 + 5/96*sqrt(-c^2*x^2 + 1)*b*d^2*x/c + 5/96*b*d^2*arcsin(c*x)
/c^2
```

3.14 $\int \left(d-c^2 d x^2\right)^2 \left(a+b \sin^{-1}(cx)\right) dx$

Optimal. Leaf size=131

$$\frac{1}{5}c^4d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{25c}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{45c}$$

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(15*c) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(45*c) +
 (b*d^2*(1 - c^2*x^2)^(5/2))/(25*c) + d^2*x*(a + b*ArcSin[c*x]) - (2*c^2*d^
2*x^3*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^5*(a + b*ArcSin[c*x]))/5
```

Rubi [A] time = 0.104451, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {194, 4645, 12, 1247, 698}

$$\frac{1}{5}c^4d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{25c}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{45c}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(15*c) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(45*c) +
 (b*d^2*(1 - c^2*x^2)^(5/2))/(25*c) + d^2*x*(a + b*ArcSin[c*x]) - (2*c^2*d^
2*x^3*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
```

```
&& IntegerQ[m]))
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx = d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin^{-1}(cx)\right)-(b$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{15}$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}$$

$$= \frac{8bd^2\sqrt{1-c^2x^2}}{15c}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{45c}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{25c}+d^2x\left(a+b\sin^{-1}(cx)\right)-$$

Mathematica [A] time = 0.0915752, size = 95, normalized size = 0.73

$$\frac{d^2\left(15acx\left(3c^4x^4-10c^2x^2+15\right)+b\sqrt{1-c^2x^2}\left(9c^4x^4-38c^2x^2+149\right)+15bcx\left(3c^4x^4-10c^2x^2+15\right)\sin^{-1}(cx)\right)}{225c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(149 - 3
8*c^2*x^2 + 9*c^4*x^4) + 15*b*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]
))/(225*c)
```

Maple [A] time = 0.004, size = 122, normalized size = 0.9

$$\frac{1}{c}\left(d^2a\left(\frac{c^5x^5}{5}-\frac{2\,c^3x^3}{3}+cx\right)+d^2b\left(\frac{\arcsin(cx)\,c^5x^5}{5}-\frac{2\,c^3x^3\arcsin(cx)}{3}+cx\arcsin(cx)+\frac{c^4x^4}{25}\sqrt{-c^2x^2+1}-\frac{38\,c^2x^2}{225}\sqrt{\ }\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(d^2*a*(1/5*c^5*x^5-2/3*c^3*x^3+c*x)+d^2*b*(1/5*arcsin(c*x)*c^5*x^5-2/3
*c^3*x^3*arcsin(c*x)+c*x*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-38/225
*c^2*x^2*(-c^2*x^2+1)^(1/2)+149/225*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.70968, size = 265, normalized size = 2.02

$$\frac{1}{5}\,ac^4d^2x^5+\frac{1}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^4d^2-\frac{2}{3}\,ac^2d^2x^3-\frac{2}{9}\left(3\,x^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*c^4*d^2*x^5 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^
2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^4*d^2 -
 2/3*a*c^2*d^2*x^3 - 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d^2 + a*d^2*x + (c*x*arcsin(c*x) + sqrt
(-c^2*x^2 + 1))*b*d^2/c
```

Fricas [A] time = 2.09164, size = 274, normalized size = 2.09

$$\frac{45\,ac^5d^2x^5 - 150\,ac^3d^2x^3 + 225\,acd^2x + 15\left(3\,bc^5d^2x^5 - 10\,bc^3d^2x^3 + 15\,bcd^2x\right)\arcsin\left(cx\right) + \left(9\,bc^4d^2x^4 - 38\,bc^2d^2x^2\right.}{225\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*d^2*x^5 - 150*a*c^3*d^2*x^3 + 225*a*c*d^2*x + 15*(3*b*c^5*d
^2*x^5 - 10*b*c^3*d^2*x^3 + 15*b*c*d^2*x)*arcsin(c*x) + (9*b*c^4*d^2*x^4 -
38*b*c^2*d^2*x^2 + 149*b*d^2)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] time = 4.83471, size = 165, normalized size = 1.26

$$\begin{cases} \frac{ac^4d^2x^5}{5} - \frac{2ac^2d^2x^3}{3} + ad^2x + \frac{bc^4d^2x^5\operatorname{asin}(cx)}{5} + \frac{bc^3d^2x^4\sqrt{-c^2x^2+1}}{25} - \frac{2bc^2d^2x^3\operatorname{asin}(cx)}{3} - \frac{38bcd^2x^2\sqrt{-c^2x^2+1}}{225} + bd^2x\operatorname{asin}(cx) + \frac{149bd}{} \\ ad^2x \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**5/5 - 2*a*c**2*d**2*x**3/3 + a*d**2*x + b*c**4*d*
*2*x**5*asin(c*x)/5 + b*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1)/25 - 2*b*c**2*d
**2*x**3*asin(c*x)/3 - 38*b*c*d**2*x**2*sqrt(-c**2*x**2 + 1)/225 + b*d**2*x
*asin(c*x) + 149*b*d**2*sqrt(-c**2*x**2 + 1)/(225*c), Ne(c, 0)), (a*d**2*x,
 True))
```

Giac [A] time = 1.21212, size = 213, normalized size = 1.63

$$\frac{1}{5}\,ac^4d^2x^5 - \frac{2}{3}\,ac^2d^2x^3 + \frac{1}{5}\left(c^2x^2 - 1\right)^2bd^2x\arcsin\left(cx\right) - \frac{4}{15}\left(c^2x^2 - 1\right)bd^2x\arcsin\left(cx\right) + \frac{8}{15}\,bd^2x\arcsin\left(cx\right) + \frac{\left(c^2x^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*c^4*d^2*x^5 - 2/3*a*c^2*d^2*x^3 + 1/5*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(
c*x) - 4/15*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x) + 8/15*b*d^2*x*arcsin(c*x) +
1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c + a*d^2*x + 4/45*(-c^2*x^2
+ 1)^(3/2)*b*d^2/c + 8/15*sqrt(-c^2*x^2 + 1)*b*d^2/c
```

3.15 $\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=184

$$-\frac{1}{2}ibd^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{4}d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id^2\left(a+b\sin^{-1}(c\right.}{2b}$$

```
[Out] (-11*b*c*d^2*x*Sqrt[1 - c^2*x^2])/32 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2))/16 -
 (11*b*d^2*ArcSin[c*x])/32 + (d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d
^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/4 - ((I/2)*d^2*(a + b*ArcSin[c*x])^
2)/b + d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d^2
*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.201675, antiderivative size = 184, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4683, 4625, 3717, 2190, 2279, 2391, 195, 216}

$$-\frac{1}{2}ibd^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{4}d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{id^2\left(a+b\sin^{-1}(c\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-11*b*c*d^2*x*Sqrt[1 - c^2*x^2])/32 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2))/16 -
 (11*b*d^2*ArcSin[c*x])/32 + (d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d
^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/4 - ((I/2)*d^2*(a + b*ArcSin[c*x])^
2)/b + d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d^2
*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = \frac{1}{4}d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)+d\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)}{x}\,dx-\frac{1}{4}\left(b\right.$$

$$= -\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}+\frac{1}{2}d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}d^2\left(1-c^2x^2\right)^2\left(a\right.$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}-\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}+\frac{1}{2}d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}-\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}-\frac{11}{32}bd^2\sin^{-1}(cx)+\frac{1}{2}d^2\left(1-c^2x^2\right.$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}-\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}-\frac{11}{32}bd^2\sin^{-1}(cx)+\frac{1}{2}d^2\left(1-c^2x^2\right.$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}-\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}-\frac{11}{32}bd^2\sin^{-1}(cx)+\frac{1}{2}d^2\left(1-c^2x^2\right.$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}-\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}-\frac{11}{32}bd^2\sin^{-1}(cx)+\frac{1}{2}d^2\left(1-c^2x^2\right.$$

Mathematica [A] time = 0.161432, size = 142, normalized size = 0.77

$$\frac{1}{32}d^2\left(-16ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+8ac^4x^4-32ac^2x^2+32a\log(x)+2bc^3x^3\sqrt{1-c^2x^2}-13bcx\sqrt{1-c^2x^2}+b\sin^{-1}(\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (d^2*(-32*a*c^2*x^2 + 8*a*c^4*x^4 - 13*b*c*x*Sqrt[1 - c^2*x^2] + 2*b*c^3*x^
3*Sqrt[1 - c^2*x^2] - (16*I)*b*ArcSin[c*x]^2 + b*ArcSin[c*x]*(13 - 32*c^2*x
^2 + 8*c^4*x^4 + 32*Log[1 - E^((2*I)*ArcSin[c*x])]) + 32*a*Log[x] - (16*I)*
b*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/32
```

Maple [A] time = 0.219, size = 250, normalized size = 1.4

$$\frac{d^2ac^4x^4}{4} - d^2ac^2x^2 + d^2a\ln(cx) + \frac{d^2b\arcsin(cx)\,c^4x^4}{4} - d^2b\arcsin(cx)\,c^2x^2 + \frac{13\,bd^2\arcsin(cx)}{32} + \frac{d^2bc^3x^3}{16}\sqrt{-c^2x^2+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x)
```

```
[Out] 1/4*d^2*a*c^4*x^4-d^2*a*c^2*x^2+d^2*a*ln(c*x)+1/4*d^2*b*arcsin(c*x)*c^4*x^4
-d^2*b*arcsin(c*x)*c^2*x^2+13/32*b*d^2*arcsin(c*x)+1/16*d^2*b*(-c^2*x^2+1)^
(1/2)*c^3*x^3-13/32*b*c*d^2*x*(-c^2*x^2+1)^(1/2)-I*d^2*b*polylog(2,I*c*x+(-
c^2*x^2+1)^(1/2))+d^2*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+d^2*b*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*d^2*b*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))-1/2*I*b*d^2*arcsin(c*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}\,ac^4d^2x^4 - ac^2d^2x^2 + ad^2\log(x) + \int \frac{\left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/4*a*c^4*d^2*x^4 - a*c^2*d^2*x^2 + a*d^2*log(x) + integrate((b*c^4*d^2*x^4
 - 2*b*c^2*d^2*x^2 + b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x
)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin(cx)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int \frac{a}{x}\,dx + \int -2ac^2x\,dx + \int ac^4x^3\,dx + \int \frac{b\,\mathrm{asin}(cx)}{x}\,dx + \int -2bc^2x\,\mathrm{asin}(cx)\,dx + \int bc^4x^3\,\mathrm{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x,x)
```

```
[Out] d**2*(Integral(a/x, x) + Integral(-2*a*c**2*x, x) + Integral(a*c**4*x**3, x
) + Integral(b*asin(c*x)/x, x) + Integral(-2*b*c**2*x*asin(c*x), x) + Integ
ral(b*c**4*x**3*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2-d\right)^2(b\arcsin\left(cx\right)+a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)/x, x)
```

3.16 $\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=123

$$\frac{1}{3}c^4d^2x^3\left(a+b\sin^{-1}(cx)\right)-2c^2d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{9}bcd^2\left(1-c^2x^2\right)^{3/2}-\frac{5}{3}bcd^2\sqrt{1-c^2x^2}-bcd$$

```
[Out] (-5*b*c*d^2*Sqrt[1 - c^2*x^2])/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2))/9 - (d^2*(
a + b*ArcSin[c*x]))/x - 2*c^2*d^2*x*(a + b*ArcSin[c*x]) + (c^4*d^2*x^3*(a +
 b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rubi [A] time = 0.15514, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {270, 4687, 12, 1251, 897, 1153, 208}

$$\frac{1}{3}c^4d^2x^3\left(a+b\sin^{-1}(cx)\right)-2c^2d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{9}bcd^2\left(1-c^2x^2\right)^{3/2}-\frac{5}{3}bcd^2\sqrt{1-c^2x^2}-bcd$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-5*b*c*d^2*Sqrt[1 - c^2*x^2])/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2))/9 - (d^2*(
a + b*ArcSin[c*x]))/x - 2*c^2*d^2*x*(a + b*ArcSin[c*x]) + (c^4*d^2*x^3*(a +
 b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
```

```
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-2c^2d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^2x^3\left(a+b\sin^{-1}(cx)\right)-$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-2c^2d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^2x^3\left(a+b\sin^{-1}(cx)\right)-$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-2c^2d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^2x^3\left(a+b\sin^{-1}(cx)\right)-$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-2c^2d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^2x^3\left(a+b\sin^{-1}(cx)\right)+$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-2c^2d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^2x^3\left(a+b\sin^{-1}(cx)\right)+$$

$$= -\frac{5}{3}bcd^2\sqrt{1-c^2x^2}-\frac{1}{9}bcd^2\left(1-c^2x^2\right)^{3/2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-2c^2d^2x\left(a+b\,\mathrm{s}\right.$$

$$= -\frac{5}{3}bcd^2\sqrt{1-c^2x^2}-\frac{1}{9}bcd^2\left(1-c^2x^2\right)^{3/2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}-2c^2d^2x\left(a+b\,\mathrm{s}\right.$$

Mathematica [A] time = 0.0902922, size = 126, normalized size = 1.02

$$\frac{d^2\left(3ac^4x^4-18ac^2x^2-9a+bc^3x^3\sqrt{1-c^2x^2}-16bcx\sqrt{1-c^2x^2}-9bcx\log\left(\sqrt{1-c^2x^2}+1\right)+3b\left(c^4x^4-6c^2x^2-3\right)\sin\right.}{9x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (d^2*(-9*a - 18*a*c^2*x^2 + 3*a*c^4*x^4 - 16*b*c*x*Sqrt[1 - c^2*x^2] + b*c^
3*x^3*Sqrt[1 - c^2*x^2] + 3*b*(-3 - 6*c^2*x^2 + c^4*x^4)*ArcSin[c*x] + 9*b*
c*x*Log[x] - 9*b*c*x*Log[1 + Sqrt[1 - c^2*x^2]]))/(9*x)
```

Maple [A] time = 0.007, size = 117, normalized size = 1.

$$c\left(d^2a\left(\frac{c^3x^3}{3}-2\,cx-\frac{1}{cx}\right)+d^2b\left(\frac{c^3x^3\arcsin(cx)}{3}-2\,cx\arcsin(cx)-\frac{\arcsin(cx)}{cx}+\frac{c^2x^2}{9}\sqrt{-c^2x^2+1}-\frac{16}{9}\sqrt{-c^2x^2+1}-\ldots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] c*(d^2*a*(1/3*c^3*x^3-2*c*x-1/c/x)+d^2*b*(1/3*c^3*x^3*arcsin(c*x)-2*c*x*arc
sin(c*x)-1/c/x*arcsin(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/9*(-c^2*x^2+1)
^(1/2)-arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.5615, size = 216, normalized size = 1.76

$$\frac{1}{3}\,ac^4d^2x^3+\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^4d^2-2\,ac^2d^2x-2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)b\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*c^4*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
+ 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^4*d^2 - 2*a*c^2*d^2*x - 2*(c*x*arcsin(c*x)
 + sqrt(-c^2*x^2 + 1))*b*c*d^2 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs
(x)) + arcsin(c*x)/x)*b*d^2 - a*d^2/x
```

Fricas [A] time = 2.46411, size = 343, normalized size = 2.79

$$\frac{6\,ac^4d^2x^4-36\,ac^2d^2x^2-9\,bcd^2x\log\left(\sqrt{-c^2x^2+1}+1\right)+9\,bcd^2x\log\left(\sqrt{-c^2x^2+1}-1\right)-18\,ad^2+6\left(bc^4d^2x^4-6\,bc^2d^2x^2\ldots\right.}{18\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/18*(6*a*c^4*d^2*x^4 - 36*a*c^2*d^2*x^2 - 9*b*c*d^2*x*log(sqrt(-c^2*x^2 +
1) + 1) + 9*b*c*d^2*x*log(sqrt(-c^2*x^2 + 1) - 1) - 18*a*d^2 + 6*(b*c^4*d^2
*x^4 - 6*b*c^2*d^2*x^2 - 3*b*d^2)*arcsin(c*x) + 2*(b*c^3*d^2*x^3 - 16*b*c*d
^2*x)*sqrt(-c^2*x^2 + 1))/x
```

Sympy [A] time = 10.3568, size = 182, normalized size = 1.48

$$\frac{ac^4d^2x^3}{3}-2ac^2d^2x-\frac{ad^2}{x}-\frac{bc^5d^2\left(\begin{cases}-\frac{x^2\sqrt{-c^2x^2+1}}{3c^2}-\frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c\neq 0\\ \frac{x^4}{4} & \text{otherwise}\end{cases}\right)}{3}+\frac{bc^4d^2x^3\operatorname{asin}(cx)}{3}-2bc^2d^2\left(\begin{cases}0 & \\ x\operatorname{asin}(cx)+\ldots & \end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**2,x)
```

```
[Out] a*c**4*d**2*x**3/3 - 2*a*c**2*d**2*x - a*d**2/x - b*c**5*d**2*Piecewise((-x
**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c,
0)), (x**4/4, True))/3 + b*c**4*d**2*x**3*asin(c*x)/3 - 2*b*c**2*d**2*Piece
wise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*c*d**
2*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True
)) - b*d**2*asin(c*x)/x
```

Giac [B] time = 31.3695, size = 3668, normalized size = 29.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^9*d^2*x^8*arcsin(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/2*a*c^9*d^2*x^8
/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^
5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^8) + b*c^8*d^2*x^7*log(abs(c)*abs(x))/((c^7*x^7/(sqr
t(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(
sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^7) - b*c^8*d^2*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^7) + 16/9*b*c^8*d^2*x^7/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sq
rt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) - 6*b*c^7*d^2*x^6*arcsin
(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1)
+ 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 6*a*c^7*d^2*x^6/((c^7*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^
2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) +
 3*b*c^6*d^2*x^5*log(abs(c)*abs(x))/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 +
3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^6*d^2*
x^5*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) + 4/3*b*c^6*d^2*x^
5/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)
^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(
sqrt(-c^2*x^2 + 1) + 1)^5) - 25/3*b*c^5*d^2*x^4*arcsin(c*x)/((c^7*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1
) + 1)^4) - 25/3*a*c^5*d^2*x^4/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 3*b*c^4*d^2*x^3*l
og(abs(c)*abs(x))/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^4*d^2*x^3*log(sqrt(-c^2*
x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2
+ 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 4/3*b*c^4*d^2*x^3/((c^7*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sq
```

```
rt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
 + 1)^3) - 6*b*c^3*d^2*x^2*arcsin(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1
)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 6*a*c^3*d
^2*x^2/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^2*d^2*x*log(abs(c)*abs(x))/((c^7*x^7/
(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x
^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1)) - b*c^2*d^2*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)) - 16/9*b*c^2*d^2*x/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d^2*arcsin(c*x)/(c^7
*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*
c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*a*
c*d^2/(c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)
)
```

3.17 $\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=201

$$ibc^2d^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-c^2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d^2\left(a+b\sin^{-1}\right.}{b}$$

```
[Out] -(b*c^3*d^2*x*Sqrt[1 - c^2*x^2])/4 - (b*c*d^2*(1 - c^2*x^2)^(3/2))/(2*x) -
(b*c^2*d^2*ArcSin[c*x])/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]) - (d^
2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*x^2) + (I*c^2*d^2*(a + b*ArcSin[c
*x])^2)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] +
I*b*c^2*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.207758, antiderivative size = 201, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4685, 277, 195, 216, 4683, 4625, 3717, 2190, 2279, 2391}

$$ibc^2d^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-c^2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-\frac{d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{ic^2d^2\left(a+b\sin^{-1}\right.}{b}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(b*c^3*d^2*x*Sqrt[1 - c^2*x^2])/4 - (b*c*d^2*(1 - c^2*x^2)^(3/2))/(2*x) -
(b*c^2*d^2*ArcSin[c*x])/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]) - (d^
2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*x^2) + (I*c^2*d^2*(a + b*ArcSin[c
*x])^2)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] +
I*b*c^2*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 4685

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcSin[c*x
]))/(f*(m + 1)), x] + (-Dist[(b*c*d^p)/(f*(m + 1)), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d^2(1-c^2x^2)^2(a+b\sin^{-1}(cx))}{2x^2} - (2c^2d)\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))}{x}\,dx$$
$$= -\frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - c^2d^2(1-c^2x^2)(a+b\sin^{-1}(cx)) - \frac{d^2(1-c^2x^2)^2(a+b\sin}{2x^2}$$
$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - c^2d^2(1-c^2x^2)(a+b\sin^{-1}(cx)) -$$
$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2(1-c^2x^2)($$
$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2(1-c^2x^2)($$
$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2(1-c^2x^2)($$
$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2(1-c^2x^2)($$

Mathematica [A] time = 0.166968, size = 162, normalized size = 0.81

$$\frac{d^2\left(4ibc^2x^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+2ac^4x^4-8ac^2x^2\log(x)-2a+bc^3x^3\sqrt{1-c^2x^2}-2bcx\sqrt{1-c^2x^2}+4ibc^2x^2\sin^{-1}(\right.}{4x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (d^2*(-2*a + 2*a*c^4*x^4 - 2*b*c*x*Sqrt[1 - c^2*x^2] + b*c^3*x^3*Sqrt[1 - c
^2*x^2] + (4*I)*b*c^2*x^2*ArcSin[c*x]^2 + b*ArcSin[c*x]*(-2 - c^2*x^2 + 2*c
^4*x^4 - 8*c^2*x^2*Log[1 - E^((2*I)*ArcSin[c*x])]) - 8*a*c^2*x^2*Log[x] + (
4*I)*b*c^2*x^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(4*x^2)
```

Maple [A] time = 0.375, size = 278, normalized size = 1.4

$$\frac{c^4d^2ax^2}{2} - \frac{d^2a}{2x^2} - 2c^2d^2a\ln(cx) + ic^2d^2b(\arcsin(cx))^2 + \frac{bc^3d^2x}{4}\sqrt{-c^2x^2+1} + \frac{c^4d^2b\arcsin(cx)x^2}{2} - \frac{bc^2d^2\arcsin(c}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] 1/2*c^4*d^2*a*x^2-1/2*d^2*a/x^2-2*c^2*d^2*a*ln(c*x)+I*c^2*d^2*b*arcsin(c*x)
^2+1/4*b*c^3*d^2*x*(-c^2*x^2+1)^(1/2)+1/2*c^4*d^2*b*arcsin(c*x)*x^2-1/4*b*c
^2*d^2*arcsin(c*x)+1/2*I*c^2*d^2*b-1/2*b*c*d^2*(-c^2*x^2+1)^(1/2)/x-1/2*d^2
*b*arcsin(c*x)/x^2-2*c^2*d^2*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2
*c^2*d^2*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*c^2*d^2*b*polylog
(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*c^2*d^2*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\,ac^4d^2x^2 - 2\,ac^2d^2\log\left(x\right) - \frac{1}{2}\,bd^2\left(\frac{\sqrt{-c^2x^2+1}c}{x} + \frac{\arcsin\left(cx\right)}{x^2}\right) - \frac{ad^2}{2\,x^2} + \int \frac{\left(bc^4d^2x^2 - 2\,bc^2d^2\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-\right.}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*c^4*d^2*x^2 - 2*a*c^2*d^2*log(x) - 1/2*b*d^2*(sqrt(-c^2*x^2 + 1)*c/x
+ arcsin(c*x)/x^2) - 1/2*a*d^2/x^2 + integrate((b*c^4*d^2*x^2 - 2*b*c^2*d^2
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int \frac{a}{x^3}\,dx + \int -\frac{2ac^2}{x}\,dx + \int ac^4x\,dx + \int \frac{b\,\mathrm{asin}\left(cx\right)}{x^3}\,dx + \int -\frac{2bc^2\,\mathrm{asin}\left(cx\right)}{x}\,dx + \int bc^4x\,\mathrm{asin}\left(cx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**3,x)
```

```
[Out] d**2*(Integral(a/x**3, x) + Integral(-2*a*c**2/x, x) + Integral(a*c**4*x, x
) + Integral(b*asin(c*x)/x**3, x) + Integral(-2*b*c**2*asin(c*x)/x, x) + In
tegral(b*c**4*x*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2 - d\right)^2\left(b\arcsin\left(cx\right) + a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)/x^3, x)
```

3.18 $\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=128

$$c^4d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}+\frac{11}{6}bc^3d^2$$

```
[Out] b*c^3*d^2*Sqrt[1 - c^2*x^2] - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) + (2*c^2*d^2*(a + b*ArcSin[c*x]))/x + c^4*d^2*x*
(a + b*ArcSin[c*x]) + (11*b*c^3*d^2*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rubi [A] time = 0.161704, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {270, 4687, 12, 1251, 897, 1157, 388, 208}

$$c^4d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}+\frac{11}{6}bc^3d^2$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] b*c^3*d^2*Sqrt[1 - c^2*x^2] - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) + (2*c^2*d^2*(a + b*ArcSin[c*x]))/x + c^4*d^2*x*
(a + b*ArcSin[c*x]) + (11*b*c^3*d^2*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
```

```
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1157

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, -Simp[(R*x*(d + e*x^2)^(q + 1))/(2*d*(q + 1)), x] + Dist[1/(2*d*(q +
 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x],
 x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 -
 b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx = -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}+c^4d^2x\left(a+b\sin^{-1}(cx)\right)-(bc)\int$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}+c^4d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}\left(bcd\right.$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}+c^4d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}\left(bcd\right.$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}+c^4d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{\left(bd^2\right)}{}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}+c^4d^2x\left(a+b\sin\right.$$

$$= bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}$$

$$= bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{2c^2d^2\left(a+b\sin^{-1}(cx)\right)}{x}$$

Mathematica [A] time = 0.0932271, size = 136, normalized size = 1.06

$$\frac{d^2\left(6ac^4x^4+12ac^2x^2-2a+6bc^3x^3\sqrt{1-c^2x^2}-bcx\sqrt{1-c^2x^2}-11bc^3x^3\log(x)+11bc^3x^3\log\left(\sqrt{1-c^2x^2}+1\right)+2b\left(3c^4x^4\right.\right.}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (d^2*(-2*a + 12*a*c^2*x^2 + 6*a*c^4*x^4 - b*c*x*Sqrt[1 - c^2*x^2] + 6*b*c^3
*x^3*Sqrt[1 - c^2*x^2] + 2*b*(-1 + 6*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x] - 11*
b*c^3*x^3*Log[x] + 11*b*c^3*x^3*Log[1 + Sqrt[1 - c^2*x^2]]))/(6*x^3)
```

Maple [A] time = 0.01, size = 115, normalized size = 0.9

$$c^3\left(d^2a\left(cx+2\frac{1}{cx}-\frac{1}{3c^3x^3}\right)+d^2b\left(cx\arcsin(cx)+2\frac{\arcsin(cx)}{cx}-\frac{\arcsin(cx)}{3c^3x^3}+\sqrt{-c^2x^2+1}+\frac{11}{6}\mathrm{Artanh}\left(\frac{1}{\sqrt{-c^2x^2}}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] c^3*(d^2*a*(c*x+2/c/x-1/3/c^3/x^3)+d^2*b*(c*x*arcsin(c*x)+2/c/x*arcsin(c*x)
-1/3/c^3/x^3*arcsin(c*x)+(-c^2*x^2+1)^(1/2)+11/6*arctanh(1/(-c^2*x^2+1)^(1/
2))-1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.58534, size = 230, normalized size = 1.8

$$ac^4d^2x+\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bc^3d^2+2\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bc^2d^2-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-}}{}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] a*c^4*d^2*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*c^3*d^2 + 2*(c*log(2
*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*c^2*d^2 - 1/6*((c
^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c
+ 2*arcsin(c*x)/x^3)*b*d^2 + 2*a*c^2*d^2/x - 1/3*a*d^2/x^3
```

Fricas [A] time = 2.52897, size = 358, normalized size = 2.8

$$\frac{12\,ac^4d^2x^4+11\,bc^3d^2x^3\log\left(\sqrt{-c^2x^2+1}+1\right)-11\,bc^3d^2x^3\log\left(\sqrt{-c^2x^2+1}-1\right)+24\,ac^2d^2x^2-4\,ad^2+4\left(3\,bc^4d^2x^4+\right.}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(12*a*c^4*d^2*x^4 + 11*b*c^3*d^2*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - 11*
b*c^3*d^2*x^3*log(sqrt(-c^2*x^2 + 1) - 1) + 24*a*c^2*d^2*x^2 - 4*a*d^2 + 4*
(3*b*c^4*d^2*x^4 + 6*b*c^2*d^2*x^2 - b*d^2)*arcsin(c*x) + 2*(6*b*c^3*d^2*x^
3 - b*c*d^2*x)*sqrt(-c^2*x^2 + 1))/x^3
```

Sympy [A] time = 12.1423, size = 235, normalized size = 1.84

$$ac^4d^2x + \frac{2ac^2d^2}{x} - \frac{ad^2}{3x^3} + bc^4d^2\left(\begin{cases}0 & \text{for } c = 0\\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right) - 2bc^3d^2\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right) + \frac{2bc^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**4,x)
```

```
[Out] a*c**4*d**2*x + 2*a*c**2*d**2/x - a*d**2/(3*x**3) + b*c**4*d**2*Piecewise((
0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) - 2*b*c**3*d**2
*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)
) + 2*b*c**2*d**2*asin(c*x)/x + b*c*d**2*Piecewise((-c**2*acosh(1/(c*x))/2
- c*sqrt(-1 + 1/(c**2*x**2))/(2*x), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(
c*x))/2 - I*c/(2*x*sqrt(1 - 1/(c**2*x**2))) + I/(2*c*x**3*sqrt(1 - 1/(c**2*
x**2))), True))/3 - b*d**2*asin(c*x)/(3*x**3)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\text{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

3.19 $\int x^4 \left(d-c^2 d x^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=232

$$-\frac{1}{11}c^6 d^3 x^{11}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4 d^3 x^9\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2 d^3 x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}d^3 x^5\left(a+b\sin^{-1}(cx)\right)+\frac{bd^3}{}$$

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(1155*c^5) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(34
65*c^5) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(1925*c^5) + (b*d^3*(1 - c^2*x^2)^(
7/2))/(1617*c^5) - (4*b*d^3*(1 - c^2*x^2)^(9/2))/(297*c^5) + (b*d^3*(1 - c^
2*x^2)^(11/2))/(121*c^5) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 - (3*c^2*d^3*x^7
*(a + b*ArcSin[c*x]))/7 + (c^4*d^3*x^9*(a + b*ArcSin[c*x]))/3 - (c^6*d^3*x^
11*(a + b*ArcSin[c*x]))/11
```

Rubi [A] time = 0.29056, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {270, 4687, 12, 1799, 1620}

$$-\frac{1}{11}c^6 d^3 x^{11}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4 d^3 x^9\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2 d^3 x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}d^3 x^5\left(a+b\sin^{-1}(cx)\right)+\frac{bd^3}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```


```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(1155*c^5) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(34
65*c^5) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(1925*c^5) + (b*d^3*(1 - c^2*x^2)^(
7/2))/(1617*c^5) - (4*b*d^3*(1 - c^2*x^2)^(9/2))/(297*c^5) + (b*d^3*(1 - c^
2*x^2)^(11/2))/(121*c^5) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 - (3*c^2*d^3*x^7
*(a + b*ArcSin[c*x]))/7 + (c^4*d^3*x^9*(a + b*ArcSin[c*x]))/3 - (c^6*d^3*x^
11*(a + b*ArcSin[c*x]))/11
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
```

```
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rubi steps

$$\int x^4 \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{16bd^3\sqrt{1-c^2x^2}}{1155c^5}+\frac{8bd^3\left(1-c^2x^2\right)^{3/2}}{3465c^5}+\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{1925c^5}+\frac{bd^3\left(1-c^2x^2\right)^{7/2}}{1617c^5}-$$

Mathematica [A] time = 0.188538, size = 143, normalized size = 0.62

$$\frac{d^3\left(-3465ac^5x^5\left(105c^6x^6-385c^4x^4+495c^2x^2-231\right)+b\sqrt{1-c^2x^2}\left(-33075c^{10}x^{10}+111475c^8x^8-117625c^6x^6+18933c\right.\right.}{4002075c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-3465*a*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4 + 105*c^6*x^6) + b*
Sqrt[1 - c^2*x^2]*(50488 + 25244*c^2*x^2 + 18933*c^4*x^4 - 117625*c^6*x^6 +
 111475*c^8*x^8 - 33075*c^10*x^10) - 3465*b*c^5*x^5*(-231 + 495*c^2*x^2 - 3
85*c^4*x^4 + 105*c^6*x^6)*ArcSin[c*x]))/(4002075*c^5)
```

Maple [A] time = 0.016, size = 214, normalized size = 0.9

$$\frac{1}{c^5}\left(-d^3a\left(\frac{c^{11}x^{11}}{11}-\frac{c^9x^9}{3}+\frac{3\,c^7x^7}{7}-\frac{c^5x^5}{5}\right)-d^3b\left(\frac{\arcsin(cx)\,c^{11}x^{11}}{11}-\frac{\arcsin(cx)\,c^9x^9}{3}+\frac{3\,\arcsin(cx)\,c^7x^7}{7}-\frac{\arcsin(cx}{5}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^5*(-d^3*a*(1/11*c^11*x^11-1/3*c^9*x^9+3/7*c^7*x^7-1/5*c^5*x^5)-d^3*b*(1
/11*arcsin(c*x)*c^11*x^11-1/3*arcsin(c*x)*c^9*x^9+3/7*arcsin(c*x)*c^7*x^7-1
/5*arcsin(c*x)*c^5*x^5+1/121*c^10*x^10*(-c^2*x^2+1)^(1/2)-91/3267*c^8*x^8*(
-c^2*x^2+1)^(1/2)+4705/160083*c^6*x^6*(-c^2*x^2+1)^(1/2)-6311/1334025*c^4*x
```

```
^4*(-c^2*x^2+1)^(1/2)-25244/4002075*c^2*x^2*(-c^2*x^2+1)^(1/2)-50488/400207
5*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.57926, size = 647, normalized size = 2.79

$$-\frac{1}{11}\,ac^6d^3x^{11}+\frac{1}{3}\,ac^4d^3x^9-\frac{3}{7}\,ac^2d^3x^7-\frac{1}{7623}\left(693\,x^{11}\arcsin\left(cx\right)+\left(\frac{63\,\sqrt{-c^2x^2+1}x^{10}}{c^2}+\frac{70\,\sqrt{-c^2x^2+1}x^8}{c^4}+80\,\sqrt{-\cdots}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/11*a*c^6*d^3*x^11 + 1/3*a*c^4*d^3*x^9 - 3/7*a*c^2*d^3*x^7 - 1/7623*(693*
x^11*arcsin(c*x) + (63*sqrt(-c^2*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*
x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 1
28*sqrt(-c^2*x^2 + 1)*x^2/c^10 + 256*sqrt(-c^2*x^2 + 1)/c^12)*c)*b*c^6*d^3
+ 1/945*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^
2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*
x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*c^4*d^3 + 1/5*a*d^3*x^5 - 3/245
*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)
*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c
^2*d^3 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^3
```

Fricas [A] time = 2.21753, size = 489, normalized size = 2.11

$$-\frac{363825\,ac^{11}d^3x^{11}-1334025\,ac^9d^3x^9+1715175\,ac^7d^3x^7-800415\,ac^5d^3x^5+3465\left(105\,bc^{11}d^3x^{11}-385\,bc^9d^3x^9+4\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/4002075*(363825*a*c^11*d^3*x^11 - 1334025*a*c^9*d^3*x^9 + 1715175*a*c^7*
d^3*x^7 - 800415*a*c^5*d^3*x^5 + 3465*(105*b*c^11*d^3*x^11 - 385*b*c^9*d^3*
x^9 + 495*b*c^7*d^3*x^7 - 231*b*c^5*d^3*x^5)*arcsin(c*x) + (33075*b*c^10*d^
3*x^10 - 111475*b*c^8*d^3*x^8 + 117625*b*c^6*d^3*x^6 - 18933*b*c^4*d^3*x^4
- 25244*b*c^2*d^3*x^2 - 50488*b*d^3)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 91.5783, size = 289, normalized size = 1.25

$$\begin{cases} -\frac{ac^6d^3x^{11}}{11}+\frac{ac^4d^3x^9}{3}-\frac{3ac^2d^3x^7}{7}+\frac{ad^3x^5}{5}-\frac{bc^6d^3x^{11}\operatorname{asin}(cx)}{11}-\frac{bc^5d^3x^{10}\sqrt{-c^2x^2+1}}{121}+\frac{bc^4d^3x^9\operatorname{asin}(cx)}{3}+\frac{91bc^3d^3x^8\sqrt{-c^2x^2+1}}{3267}-\frac{3bc^2d^3x^7\operatorname{as}\cdots}{7} \\ \frac{ad^3x^5}{5} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**11/11 + a*c**4*d**3*x**9/3 - 3*a*c**2*d**3*x**7/
7 + a*d**3*x**5/5 - b*c**6*d**3*x**11*asin(c*x)/11 - b*c**5*d**3*x**10*sqrt
(-c**2*x**2 + 1)/121 + b*c**4*d**3*x**9*asin(c*x)/3 + 91*b*c**3*d**3*x**8*s
```

```
qrt(-c**2*x**2 + 1)/3267 - 3*b*c**2*d**3*x**7*asin(c*x)/7 - 4705*b*c*d**3*x
**6*sqrt(-c**2*x**2 + 1)/160083 + b*d**3*x**5*asin(c*x)/5 + 6311*b*d**3*x**
4*sqrt(-c**2*x**2 + 1)/(1334025*c) + 25244*b*d**3*x**2*sqrt(-c**2*x**2 + 1)
/(4002075*c**3) + 50488*b*d**3*sqrt(-c**2*x**2 + 1)/(4002075*c**5), Ne(c, 0
)), (a*d**3*x**5/5, True))
```

Giac [A] time = 1.28889, size = 477, normalized size = 2.06

$$-\frac{1}{11}\,ac^6d^3x^{11}+\frac{1}{3}\,ac^4d^3x^9-\frac{3}{7}\,ac^2d^3x^7+\frac{1}{5}\,ad^3x^5-\frac{\left(c^2x^2-1\right)^5bd^3x\arcsin\left(cx\right)}{11\,c^4}-\frac{4\left(c^2x^2-1\right)^4bd^3x\arcsin\left(cx\right)}{33\,c^4}-\frac{\left(c^2x^2 -\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/11*a*c^6*d^3*x^11 + 1/3*a*c^4*d^3*x^9 - 3/7*a*c^2*d^3*x^7 + 1/5*a*d^3*x^
5 - 1/11*(c^2*x^2 - 1)^5*b*d^3*x*arcsin(c*x)/c^4 - 4/33*(c^2*x^2 - 1)^4*b*d
^3*x*arcsin(c*x)/c^4 - 1/231*(c^2*x^2 - 1)^3*b*d^3*x*arcsin(c*x)/c^4 - 1/12
1*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 2/385*(c^2*x^2 - 1)^2*b*d^
3*x*arcsin(c*x)/c^4 - 4/297*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 -
8/1155*(c^2*x^2 - 1)*b*d^3*x*arcsin(c*x)/c^4 - 1/1617*(c^2*x^2 - 1)^3*sqrt(
-c^2*x^2 + 1)*b*d^3/c^5 + 16/1155*b*d^3*x*arcsin(c*x)/c^4 + 2/1925*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 8/3465*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^
5 + 16/1155*sqrt(-c^2*x^2 + 1)*b*d^3/c^5
```

3.20 $\int x^3 \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=206

$$\frac{d^3\left(1-c^2x^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10c^4}-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4}-\frac{bd^3x\left(1-c^2x^2\right)^{9/2}}{100c^3}+\frac{7bd^3x\left(1-c^2x^2\right)^{7/2}}{1600c^3}+\frac{49bd^3}{}$$

```
[Out] (49*b*d^3*x*Sqrt[1 - c^2*x^2])/(5120*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(3/2)
)/(7680*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(5/2))/(9600*c^3) + (7*b*d^3*x*(1
- c^2*x^2)^(7/2))/(1600*c^3) - (b*d^3*x*(1 - c^2*x^2)^(9/2))/(100*c^3) + (4
9*b*d^3*ArcSin[c*x])/(5120*c^4) - (d^3*(1 - c^2*x^2)^4*(a + b*ArcSin[c*x]))
/(8*c^4) + (d^3*(1 - c^2*x^2)^5*(a + b*ArcSin[c*x]))/(10*c^4)
```

Rubi [A] time = 0.178894, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {266, 43, 4687, 12, 388, 195, 216}

$$\frac{d^3\left(1-c^2x^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10c^4}-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4}-\frac{bd^3x\left(1-c^2x^2\right)^{9/2}}{100c^3}+\frac{7bd^3x\left(1-c^2x^2\right)^{7/2}}{1600c^3}+\frac{49bd^3}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (49*b*d^3*x*Sqrt[1 - c^2*x^2])/(5120*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(3/2)
)/(7680*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(5/2))/(9600*c^3) + (7*b*d^3*x*(1
- c^2*x^2)^(7/2))/(1600*c^3) - (b*d^3*x*(1 - c^2*x^2)^(9/2))/(100*c^3) + (4
9*b*d^3*ArcSin[c*x])/(5120*c^4) - (d^3*(1 - c^2*x^2)^4*(a + b*ArcSin[c*x]))
/(8*c^4) + (d^3*(1 - c^2*x^2)^5*(a + b*ArcSin[c*x]))/(10*c^4)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)dx=-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4}+\frac{d^3\left(1-c^2x^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10c^4}-(bc)\int\frac{d^3}{\ }$$

$$=-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4}+\frac{d^3\left(1-c^2x^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10c^4}-\frac{\left(bd^3\right)\int(}{\ }$$

$$=-\frac{bd^3x\left(1-c^2x^2\right)^{9/2}}{100c^3}-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4}+\frac{d^3\left(1-c^2x^2\right)^5\left(a+b\,\mathrm{si}\right.}{10c^4}$$

$$=\frac{7bd^3x\left(1-c^2x^2\right)^{7/2}}{1600c^3}-\frac{bd^3x\left(1-c^2x^2\right)^{9/2}}{100c^3}-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4}+\frac{d^3}{\ }$$

$$=\frac{49bd^3x\left(1-c^2x^2\right)^{5/2}}{9600c^3}+\frac{7bd^3x\left(1-c^2x^2\right)^{7/2}}{1600c^3}-\frac{bd^3x\left(1-c^2x^2\right)^{9/2}}{100c^3}-\frac{d^3\left(1-c^2x^2\right)}{\ }$$

$$=\frac{49bd^3x\left(1-c^2x^2\right)^{3/2}}{7680c^3}+\frac{49bd^3x\left(1-c^2x^2\right)^{5/2}}{9600c^3}+\frac{7bd^3x\left(1-c^2x^2\right)^{7/2}}{1600c^3}-\frac{bd^3x\left(1-c\right.}{100c}$$

$$=\frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3}+\frac{49bd^3x\left(1-c^2x^2\right)^{3/2}}{7680c^3}+\frac{49bd^3x\left(1-c^2x^2\right)^{5/2}}{9600c^3}+\frac{7bd^3x\left(1-c\right.}{1600c}$$

$$=\frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3}+\frac{49bd^3x\left(1-c^2x^2\right)^{3/2}}{7680c^3}+\frac{49bd^3x\left(1-c^2x^2\right)^{5/2}}{9600c^3}+\frac{7bd^3x\left(1-c\right.}{1600c}$$

Mathematica [A] time = 0.188653, size = 139, normalized size = 0.67

$$\frac{d^3\left(-1920ac^4x^4\left(4c^6x^6-15c^4x^4+20c^2x^2-10\right)+bcx\sqrt{1-c^2x^2}\left(-768c^8x^8+2736c^6x^6-3208c^4x^4+790c^2x^2+1185\right)-1\right.}{76800c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-1920*a*c^4*x^4*(-10 + 20*c^2*x^2 - 15*c^4*x^4 + 4*c^6*x^6) + b*c*x*S
qrt[1 - c^2*x^2]*(1185 + 790*c^2*x^2 - 3208*c^4*x^4 + 2736*c^6*x^6 - 768*c^
8*x^8) - 15*b*(79 - 1280*c^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x
^10)*ArcSin[c*x]))/(76800*c^4)
```

Maple [A] time = 0.013, size = 202, normalized size = 1.

$$\frac{1}{c^4}\left(-d^3a\left(\frac{c^{10}x^{10}}{10}-\frac{3\,c^8x^8}{8}+\frac{c^6x^6}{2}-\frac{c^4x^4}{4}\right)-d^3b\left(\frac{\arcsin(cx)\,c^{10}x^{10}}{10}-\frac{3\,\arcsin(cx)\,c^8x^8}{8}+\frac{\arcsin(cx)\,c^6x^6}{2}-\frac{c^4x^4\,\mathrm{ar}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^4*(-d^3*a*(1/10*c^10*x^10-3/8*c^8*x^8+1/2*c^6*x^6-1/4*c^4*x^4)-d^3*b*(1
/10*arcsin(c*x)*c^10*x^10-3/8*arcsin(c*x)*c^8*x^8+1/2*arcsin(c*x)*c^6*x^6-1
/4*c^4*x^4*arcsin(c*x)+1/100*c^9*x^9*(-c^2*x^2+1)^(1/2)-57/1600*c^7*x^7*(-c
^2*x^2+1)^(1/2)+401/9600*c^5*x^5*(-c^2*x^2+1)^(1/2)-79/7680*c^3*x^3*(-c^2*x
^2+1)^(1/2)-79/5120*c*x*(-c^2*x^2+1)^(1/2)+79/5120*arcsin(c*x)))
```

Maxima [B] time = 1.64879, size = 657, normalized size = 3.19

$$-\frac{1}{10}\,ac^6d^3x^{10}+\frac{3}{8}\,ac^4d^3x^8-\frac{1}{2}\,ac^2d^3x^6-\frac{1}{12800}\left(1280\,x^{10}\arcsin(cx)+\left(\frac{128\,\sqrt{-c^2x^2+1}x^9}{c^2}+\frac{144\,\sqrt{-c^2x^2+1}x^7}{c^4}+\frac{16}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/10*a*c^6*d^3*x^10 + 3/8*a*c^4*d^3*x^8 - 1/2*a*c^2*d^3*x^6 - 1/12800*(128
0*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 + 144*sqrt(-c^2*x^2 +
1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(-c^2*x^2 + 1)*x^3/c^
8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*
c^10))*c)*b*c^6*d^3 + 1/1024*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*
x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 1
05*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^8))*
c)*b*c^4*d^3 + 1/4*a*d^3*x^4 - 1/96*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2
+ 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6
- 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*c^2*d^3 + 1/32*(8*x^4*ar
csin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*
arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*d^3
```

Fricas [A] time = 2.08545, size = 454, normalized size = 2.2

$$-\frac{7680\,ac^{10}d^3x^{10}-28800\,ac^8d^3x^8+38400\,ac^6d^3x^6-19200\,ac^4d^3x^4+15\left(512\,bc^{10}d^3x^{10}-1920\,bc^8d^3x^8+2560\,bc^6d^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/76800*(7680*a*c^10*d^3*x^10 - 28800*a*c^8*d^3*x^8 + 38400*a*c^6*d^3*x^6
- 19200*a*c^4*d^3*x^4 + 15*(512*b*c^10*d^3*x^10 - 1920*b*c^8*d^3*x^8 + 2560
*b*c^6*d^3*x^6 - 1280*b*c^4*d^3*x^4 + 79*b*d^3)*arcsin(c*x) + (768*b*c^9*d^
3*x^9 - 2736*b*c^7*d^3*x^7 + 3208*b*c^5*d^3*x^5 - 790*b*c^3*d^3*x^3 - 1185*
```

```
b*c*d^3*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A] time = 69.1025, size = 280, normalized size = 1.36

$$\begin{cases} -\frac{ac^6d^3x^{10}}{10} + \frac{3ac^4d^3x^8}{8} - \frac{ac^2d^3x^6}{2} + \frac{ad^3x^4}{4} - \frac{bc^6d^3x^{10}\operatorname{asin}(cx)}{10} - \frac{bc^5d^3x^9\sqrt{-c^2x^2+1}}{100} + \frac{3bc^4d^3x^8\operatorname{asin}(cx)}{8} + \frac{57bc^3d^3x^7\sqrt{-c^2x^2+1}}{1600} - \frac{bc^2d^3x^6\operatorname{asin}(c}{2} \\ \frac{ad^3x^4}{4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**10/10 + 3*a*c**4*d**3*x**8/8 - a*c**2*d**3*x**6/
2 + a*d**3*x**4/4 - b*c**6*d**3*x**10*asin(c*x)/10 - b*c**5*d**3*x**9*sqrt(
-c**2*x**2 + 1)/100 + 3*b*c**4*d**3*x**8*asin(c*x)/8 + 57*b*c**3*d**3*x**7*
sqrt(-c**2*x**2 + 1)/1600 - b*c**2*d**3*x**6*asin(c*x)/2 - 401*b*c*d**3*x**
5*sqrt(-c**2*x**2 + 1)/9600 + b*d**3*x**4*asin(c*x)/4 + 79*b*d**3*x**3*sqrt
(-c**2*x**2 + 1)/(7680*c) + 79*b*d**3*x*sqrt(-c**2*x**2 + 1)/(5120*c**3) -
79*b*d**3*asin(c*x)/(5120*c**4), Ne(c, 0)), (a*d**3*x**4/4, True))
```

Giac [A] time = 1.26654, size = 331, normalized size = 1.61

$$-\frac{\left(c^2x^2-1\right)^4\sqrt{-c^2x^2+1}bd^3x}{100\,c^3} - \frac{\left(c^2x^2-1\right)^5bd^3\arcsin(cx)}{10\,c^4} - \frac{7\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}bd^3x}{1600\,c^3} - \frac{\left(c^2x^2-1\right)^5ad^3}{10\,c^4} - \frac{\left(c^2x^2-1\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/100*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 - 1/10*(c^2*x^2 - 1)^
5*b*d^3*arcsin(c*x)/c^4 - 7/1600*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^3*x
/c^3 - 1/10*(c^2*x^2 - 1)^5*a*d^3/c^4 - 1/8*(c^2*x^2 - 1)^4*b*d^3*arcsin(c*
x)/c^4 + 49/9600*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 - 1/8*(c^2*
x^2 - 1)^4*a*d^3/c^4 + 49/7680*(-c^2*x^2 + 1)^(3/2)*b*d^3*x/c^3 + 49/5120*s
qrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 49/5120*b*d^3*arcsin(c*x)/c^4
```

3.21 $\int x^2 \left(d-c^2 d x^2\right)^3 \left(a+b \sin^{-1}(cx)\right) dx$

Optimal. Leaf size=207

$$-\frac{1}{9}c^6d^3x^9\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{bd^3(\cdots}{}$$

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(315*c^3) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(945
*c^3) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(525*c^3) + (b*d^3*(1 - c^2*x^2)^(7/2
))/(441*c^3) - (b*d^3*(1 - c^2*x^2)^(9/2))/(81*c^3) + (d^3*x^3*(a + b*ArcSi
n[c*x]))/3 - (3*c^2*d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*c^4*d^3*x^7*(a + b*
ArcSin[c*x]))/7 - (c^6*d^3*x^9*(a + b*ArcSin[c*x]))/9
```

Rubi [A] time = 0.25779, antiderivative size = 207, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {270, 4687, 12, 1799, 1620}

$$-\frac{1}{9}c^6d^3x^9\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{bd^3(\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```


```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(315*c^3) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(945
*c^3) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(525*c^3) + (b*d^3*(1 - c^2*x^2)^(7/2
))/(441*c^3) - (b*d^3*(1 - c^2*x^2)^(9/2))/(81*c^3) + (d^3*x^3*(a + b*ArcSi
n[c*x]))/3 - (3*c^2*d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*c^4*d^3*x^7*(a + b*
ArcSin[c*x]))/7 - (c^6*d^3*x^9*(a + b*ArcSin[c*x]))/9
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rubi steps

$$\int x^2 \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+b\sin^{-1}(cx)\right.$$

$$= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+b\sin^{-1}(cx)\right.$$

$$= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+b\sin^{-1}(cx)\right.$$

$$= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+b\sin^{-1}(cx)\right.$$

$$= \frac{16bd^3\sqrt{1-c^2x^2}}{315c^3}+\frac{8bd^3\left(1-c^2x^2\right)^{3/2}}{945c^3}+\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{525c^3}+\frac{bd^3\left(1-c^2x^2\right)^{7/2}}{441c^3}-$$

Mathematica [A] time = 0.161514, size = 135, normalized size = 0.65

$$\frac{d^3\left(-315ac^3x^3\left(35c^6x^6-135c^4x^4+189c^2x^2-105\right)+b\sqrt{1-c^2x^2}\left(-1225c^8x^8+4675c^6x^6-6297c^4x^4+2629c^2x^2+5258\right.\right.}{99225c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-315*a*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6) + b*Sq
rt[1 - c^2*x^2]*(5258 + 2629*c^2*x^2 - 6297*c^4*x^4 + 4675*c^6*x^6 - 1225*c
^8*x^8) - 315*b*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6)*Arc
Sin[c*x]))/(99225*c^3)
```

Maple [A] time = 0.006, size = 194, normalized size = 0.9

$$\frac{1}{c^3}\left(-d^3a\left(\frac{c^9x^9}{9}-\frac{3\,c^7x^7}{7}+\frac{3\,c^5x^5}{5}-\frac{c^3x^3}{3}\right)-d^3b\left(\frac{\arcsin(cx)\,c^9x^9}{9}-\frac{3\,\arcsin(cx)\,c^7x^7}{7}+\frac{3\,\arcsin(cx)\,c^5x^5}{5}-\frac{c^3x^3\,\mathrm{arcsi}}{3}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^3*(-d^3*a*(1/9*c^9*x^9-3/7*c^7*x^7+3/5*c^5*x^5-1/3*c^3*x^3)-d^3*b*(1/9*
arcsin(c*x)*c^9*x^9-3/7*arcsin(c*x)*c^7*x^7+3/5*arcsin(c*x)*c^5*x^5-1/3*c^3
*x^3*arcsin(c*x)+1/81*c^8*x^8*(-c^2*x^2+1)^(1/2)-187/3969*c^6*x^6*(-c^2*x^2
+1)^(1/2)+2099/33075*c^4*x^4*(-c^2*x^2+1)^(1/2)-2629/99225*c^2*x^2*(-c^2*x^
2+1)^(1/2)-5258/99225*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.64068, size = 537, normalized size = 2.59

$$-\frac{1}{9}\,ac^6d^3x^9+\frac{3}{7}\,ac^4d^3x^7-\frac{1}{2835}\left(315\,x^9\arcsin\left(cx\right)+\left(\frac{35\,\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\,\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\,\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/9*a*c^6*d^3*x^9 + 3/7*a*c^4*d^3*x^7 - 1/2835*(315*x^9*arcsin(c*x) + (35*
sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x
^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^
10)*c)*b*c^6*d^3 - 3/5*a*c^2*d^3*x^5 + 3/245*(35*x^7*arcsin(c*x) + (5*sqrt(
-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)
*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^4*d^3 - 1/25*(15*x^5*arcsin(c*
x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(
-c^2*x^2 + 1)/c^6)*c)*b*c^2*d^3 + 1/3*a*d^3*x^3 + 1/9*(3*x^3*arcsin(c*x) +
c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3
```

Fricas [A] time = 2.26268, size = 428, normalized size = 2.07

$$-\frac{11025\,ac^9d^3x^9-42525\,ac^7d^3x^7+59535\,ac^5d^3x^5-33075\,ac^3d^3x^3+315\left(35\,bc^9d^3x^9-135\,bc^7d^3x^7+189\,bc^5d^3x^5-1\right.}{99225}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/99225*(11025*a*c^9*d^3*x^9 - 42525*a*c^7*d^3*x^7 + 59535*a*c^5*d^3*x^5 -
 33075*a*c^3*d^3*x^3 + 315*(35*b*c^9*d^3*x^9 - 135*b*c^7*d^3*x^7 + 189*b*c^
5*d^3*x^5 - 105*b*c^3*d^3*x^3)*arcsin(c*x) + (1225*b*c^8*d^3*x^8 - 4675*b*c
^6*d^3*x^6 + 6297*b*c^4*d^3*x^4 - 2629*b*c^2*d^3*x^2 - 5258*b*d^3)*sqrt(-c^
2*x^2 + 1))/c^3
```

Sympy [A] time = 26.9838, size = 265, normalized size = 1.28

$$\begin{cases}-\frac{ac^6d^3x^9}{9}+\frac{3ac^4d^3x^7}{7}-\frac{3ac^2d^3x^5}{5}+\frac{ad^3x^3}{3}-\frac{bc^6d^3x^9\operatorname{asin}(cx)}{9}-\frac{bc^5d^3x^8\sqrt{-c^2x^2+1}}{81}+\frac{3bc^4d^3x^7\operatorname{asin}(cx)}{7}+\frac{187bc^3d^3x^6\sqrt{-c^2x^2+1}}{3969}-\frac{3bc^2d^3x^5\,\mathrm{a}}{5} \\ \frac{ad^3x^3}{3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**9/9 + 3*a*c**4*d**3*x**7/7 - 3*a*c**2*d**3*x**5/
5 + a*d**3*x**3/3 - b*c**6*d**3*x**9*asin(c*x)/9 - b*c**5*d**3*x**8*sqrt(-c
**2*x**2 + 1)/81 + 3*b*c**4*d**3*x**7*asin(c*x)/7 + 187*b*c**3*d**3*x**6*sq
rt(-c**2*x**2 + 1)/3969 - 3*b*c**2*d**3*x**5*asin(c*x)/5 - 2099*b*c*d**3*x*
*4*sqrt(-c**2*x**2 + 1)/33075 + b*d**3*x**3*asin(c*x)/3 + 2629*b*d**3*x**2*
sqrt(-c**2*x**2 + 1)/(99225*c) + 5258*b*d**3*sqrt(-c**2*x**2 + 1)/(99225*c*
*3), Ne(c, 0)), (a*d**3*x**3/3, True))
```

Giac [A] time = 1.20336, size = 400, normalized size = 1.93

$$-\frac{1}{9}\,ac^{6}d^{3}x^{9} + \frac{3}{7}\,ac^{4}d^{3}x^{7} - \frac{3}{5}\,ac^{2}d^{3}x^{5} - \frac{\left(c^{2}x^{2}-1\right)^{4}bd^{3}x\arcsin\left(cx\right)}{9\,c^{2}} + \frac{1}{3}\,ad^{3}x^{3} - \frac{\left(c^{2}x^{2}-1\right)^{3}bd^{3}x\arcsin\left(cx\right)}{63\,c^{2}} + \frac{2\left(c^{2}x^{2}-1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/9*a*c^6*d^3*x^9 + 3/7*a*c^4*d^3*x^7 - 3/5*a*c^2*d^3*x^5 - 1/9*(c^2*x^2 -
 1)^4*b*d^3*x*arcsin(c*x)/c^2 + 1/3*a*d^3*x^3 - 1/63*(c^2*x^2 - 1)^3*b*d^3*
x*arcsin(c*x)/c^2 + 2/105*(c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x)/c^2 - 1/81*(c
^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 - 8/315*(c^2*x^2 - 1)*b*d^3*x*ar
csin(c*x)/c^2 - 1/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 + 16/315
*b*d^3*x*arcsin(c*x)/c^2 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3/c
^3 + 8/945*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^3 + 16/315*sqrt(-c^2*x^2 + 1)*b*d^3
/c^3
```

3.22 $\int x\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx$

<u>**Optimal**</u>. Leaf size=150

$$-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{bd^3x\left(1-c^2x^2\right)^{7/2}}{64c}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}}{384c}+\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}}{1536c}+\frac{35bd^3x\sqrt{1-c^2x}}{1024c}$$

```
[Out] (35*b*d^3*x*Sqrt[1 - c^2*x^2])/(1024*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2))/
(1536*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2))/(384*c) + (b*d^3*x*(1 - c^2*x^2)
^(7/2))/(64*c) + (35*b*d^3*ArcSin[c*x])/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(
a + b*ArcSin[c*x]))/(8*c^2)
```

<u>**Rubi**</u> **[A]** time = 0.0762765, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {4677, 195, 216}

$$-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{bd^3x\left(1-c^2x^2\right)^{7/2}}{64c}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}}{384c}+\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}}{1536c}+\frac{35bd^3x\sqrt{1-c^2x}}{1024c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (35*b*d^3*x*Sqrt[1 - c^2*x^2])/(1024*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2))/
(1536*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2))/(384*c) + (b*d^3*x*(1 - c^2*x^2)
^(7/2))/(64*c) + (35*b*d^3*ArcSin[c*x])/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(
a + b*ArcSin[c*x]))/(8*c^2)
```

<u>Rule 4677</u>

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

<u>Rule 195</u>

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

<u>Rule 216</u>

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

<u>Rubi steps</u>

$$\int x\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)dx = -\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{\left(bd^3\right)\int\left(1-c^2x^2\right)^{7/2}dx}{8c}$$

$$=\frac{bd^3x\left(1-c^2x^2\right)^{7/2}}{64c}-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{\left(7bd^3\right)\int\left(1-c^2x^2\right)^{5/2}dx}{64c}$$

$$=\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}}{384c}+\frac{bd^3x\left(1-c^2x^2\right)^{7/2}}{64c}-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{(35}{}$$

$$=\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}}{1536c}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}}{384c}+\frac{bd^3x\left(1-c^2x^2\right)^{7/2}}{64c}-\frac{d^3\left(1-c^2x^2\right)^4}{}$$

$$=\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}+\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}}{1536c}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}}{384c}+\frac{bd^3x\left(1-c^2x^2\right.}{64c}$$

$$=\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}+\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}}{1536c}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}}{384c}+\frac{bd^3x\left(1-c^2x^2\right.}{64c}$$

Mathematica [A] time = 0.0807438, size = 110, normalized size = 0.73

$$-\frac{d^3\left(384a\left(c^2x^2-1\right)^4+bcx\sqrt{1-c^2x^2}\left(48c^6x^6-200c^4x^4+326c^2x^2-279\right)+3b\left(128c^8x^8-512c^6x^6+768c^4x^4-512c^2x^2\right.\right.}{3072c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(d^3*(384*a*(-1 + c^2*x^2)^4 + b*c*x*Sqrt[1 - c^2*x^2]*(-279 + 326*c^2*x^2
 - 200*c^4*x^4 + 48*c^6*x^6) + 3*b*(93 - 512*c^2*x^2 + 768*c^4*x^4 - 512*c^
6*x^6 + 128*c^8*x^8)*ArcSin[c*x]))/(3072*c^2)
```

Maple [A] time = 0.004, size = 182, normalized size = 1.2

$$\frac{1}{c^2}\left(-d^3a\left(\frac{c^8x^8}{8}-\frac{c^6x^6}{2}+\frac{3\,c^4x^4}{4}-\frac{c^2x^2}{2}\right)-d^3b\left(\frac{\arcsin(cx)\,c^8x^8}{8}-\frac{\arcsin(cx)\,c^6x^6}{2}+\frac{3\,c^4x^4\arcsin(cx)}{4}-\frac{c^2x^2\arcsin(c}{2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^2*(-d^3*a*(1/8*c^8*x^8-1/2*c^6*x^6+3/4*c^4*x^4-1/2*c^2*x^2)-d^3*b*(1/8*
arcsin(c*x)*c^8*x^8-1/2*arcsin(c*x)*c^6*x^6+3/4*c^4*x^4*arcsin(c*x)-1/2*c^2
*x^2*arcsin(c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(1/2)-25/384*c^5*x^5*(-c^2*x^2+1
)^(1/2)+163/1536*c^3*x^3*(-c^2*x^2+1)^(1/2)-93/1024*c*x*(-c^2*x^2+1)^(1/2)+
93/1024*arcsin(c*x)))
```

Maxima [B] time = 1.77141, size = 548, normalized size = 3.65

$$-\frac{1}{8}ac^6d^3x^8+\frac{1}{2}ac^4d^3x^6-\frac{1}{3072}\left(384\,x^8\arcsin(cx)+\left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2}+\frac{56\sqrt{-c^2x^2+1}x^5}{c^4}+\frac{70\sqrt{-c^2x^2+1}x^3}{c^6}+\frac{105\,\sqrt{}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/8*a*c^6*d^3*x^8 + 1/2*a*c^4*d^3*x^6 - 1/3072*(384*x^8*arcsin(c*x) + (48*
sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x
^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(c^2)
)/(sqrt(c^2)*c^8))*c)*b*c^6*d^3 - 3/4*a*c^2*d^3*x^4 + 1/96*(48*x^6*arcsin(c
*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sq
rt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*c
^4*d^3 - 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-
c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*c^2*d^
3 + 1/2*a*d^3*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 -
arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^2)))*b*d^3
```

Fricas [A] time = 2.12246, size = 404, normalized size = 2.69

$$-\frac{384\,ac^8d^3x^8 - 1536\,ac^6d^3x^6 + 2304\,ac^4d^3x^4 - 1536\,ac^2d^3x^2 + 3\left(128\,bc^8d^3x^8 - 512\,bc^6d^3x^6 + 768\,bc^4d^3x^4 - 512\,bc^2d\right.}{3072\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3072*(384*a*c^8*d^3*x^8 - 1536*a*c^6*d^3*x^6 + 2304*a*c^4*d^3*x^4 - 1536
*a*c^2*d^3*x^2 + 3*(128*b*c^8*d^3*x^8 - 512*b*c^6*d^3*x^6 + 768*b*c^4*d^3*x
^4 - 512*b*c^2*d^3*x^2 + 93*b*d^3)*arcsin(c*x) + (48*b*c^7*d^3*x^7 - 200*b*
c^5*d^3*x^5 + 326*b*c^3*d^3*x^3 - 279*b*c*d^3*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] time = 17.4734, size = 253, normalized size = 1.69

$$\begin{cases} -\frac{ac^6d^3x^8}{8} + \frac{ac^4d^3x^6}{2} - \frac{3ac^2d^3x^4}{4} + \frac{ad^3x^2}{2} - \frac{bc^6d^3x^8\operatorname{asin}(cx)}{8} - \frac{bc^5d^3x^7\sqrt{-c^2x^2+1}}{64} + \frac{bc^4d^3x^6\operatorname{asin}(cx)}{2} + \frac{25bc^3d^3x^5\sqrt{-c^2x^2+1}}{384} - \frac{3bc^2d^3x^4\operatorname{asin}}{4} \\ \frac{ad^3x^2}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**8/8 + a*c**4*d**3*x**6/2 - 3*a*c**2*d**3*x**4/4
+ a*d**3*x**2/2 - b*c**6*d**3*x**8*asin(c*x)/8 - b*c**5*d**3*x**7*sqrt(-c**
2*x**2 + 1)/64 + b*c**4*d**3*x**6*asin(c*x)/2 + 25*b*c**3*d**3*x**5*sqrt(-c
**2*x**2 + 1)/384 - 3*b*c**2*d**3*x**4*asin(c*x)/4 - 163*b*c*d**3*x**3*sqrt
(-c**2*x**2 + 1)/1536 + b*d**3*x**2*asin(c*x)/2 + 93*b*d**3*x*sqrt(-c**2*x*
*2 + 1)/(1024*c) - 93*b*d**3*asin(c*x)/(1024*c**2), Ne(c, 0)), (a*d**3*x**2
/2, True))
```

Giac [A] time = 1.24997, size = 227, normalized size = 1.51

$$-\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}bd^3x}{64\,c} - \frac{\left(c^2x^2-1\right)^4bd^3\arcsin(cx)}{8\,c^2} + \frac{7\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd^3x}{384\,c} - \frac{\left(c^2x^2-1\right)^4ad^3}{8\,c^2} + \frac{35\left(-c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/64*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^3*x/c - 1/8*(c^2*x^2 - 1)^4*b*
d^3*arcsin(c*x)/c^2 + 7/384*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3*x/c -
1/8*(c^2*x^2 - 1)^4*a*d^3/c^2 + 35/1536*(-c^2*x^2 + 1)^(3/2)*b*d^3*x/c + 35
/1024*sqrt(-c^2*x^2 + 1)*b*d^3*x/c + 35/1024*b*d^3*arcsin(c*x)/c^2
```

3.23 $\int (d-c^2dx^2)^3 (a+b\sin^{-1}(cx))\,dx$

Optimal. Leaf size=175

$$-\frac{1}{7}c^6d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+d^3x\left(a+b\sin^{-1}(cx)\right)+\frac{bd^3(1-c}{49c}$$

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(35*c) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(105*c)
 + (6*b*d^3*(1 - c^2*x^2)^(5/2))/(175*c) + (b*d^3*(1 - c^2*x^2)^(7/2))/(49*
c) + d^3*x*(a + b*ArcSin[c*x]) - c^2*d^3*x^3*(a + b*ArcSin[c*x]) + (3*c^4*d
^3*x^5*(a + b*ArcSin[c*x]))/5 - (c^6*d^3*x^7*(a + b*ArcSin[c*x]))/7
```

Rubi [A] time = 0.171282, antiderivative size = 175, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {194, 4645, 12, 1799, 1850}

$$-\frac{1}{7}c^6d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+d^3x\left(a+b\sin^{-1}(cx)\right)+\frac{bd^3(1-c}{49c}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```


```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(35*c) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(105*c)
 + (6*b*d^3*(1 - c^2*x^2)^(5/2))/(175*c) + (b*d^3*(1 - c^2*x^2)^(7/2))/(49*
c) + d^3*x*(a + b*ArcSin[c*x]) - c^2*d^3*x^3*(a + b*ArcSin[c*x]) + (3*c^4*d
^3*x^5*(a + b*ArcSin[c*x]))/5 - (c^6*d^3*x^7*(a + b*ArcSin[c*x]))/7
```


Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1850

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
```

```
, 0] || EqQ[n, 1])
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^6$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^6$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^6$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^6$$

$$= \frac{16bd^3\sqrt{1-c^2x^2}}{35c}+\frac{8bd^3\left(1-c^2x^2\right)^{3/2}}{105c}+\frac{6bd^3\left(1-c^2x^2\right)^{5/2}}{175c}+\frac{bd^3\left(1-c^2x^2\right)^{7/2}}{49c}+d^3$$

Mathematica [A] time = 0.205248, size = 119, normalized size = 0.68

$$-\frac{d^3\left(105acx\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)+b\sqrt{1-c^2x^2}\left(75c^6x^6-351c^4x^4+757c^2x^2-2161\right)+105bcx\left(5c^6x^6-21c^4x\right.\right.}{3675c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(d^3*(105*a*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + b*Sqrt[1 - c
^2*x^2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 105*b*c*x*(-35 +
 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]))/(3675*c)
```

Maple [A] time = 0.004, size = 164, normalized size = 0.9

$$\frac{1}{c}\left(-d^3a\left(\frac{c^7x^7}{7}-\frac{3c^5x^5}{5}+c^3x^3-cx\right)-d^3b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{3\arcsin(cx)c^5x^5}{5}+c^3x^3\arcsin(cx)-cx\arcsin(cx)+\frac{c^6}{4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(-d^3*a*(1/7*c^7*x^7-3/5*c^5*x^5+c^3*x^3-c*x)-d^3*b*(1/7*arcsin(c*x)*c^
7*x^7-3/5*arcsin(c*x)*c^5*x^5+c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)+1/49*c^6*
x^6*(-c^2*x^2+1)^(1/2)-117/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)+757/3675*c^2*x^2
*(-c^2*x^2+1)^(1/2)-2161/3675*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.63586, size = 414, normalized size = 2.37

$$-\frac{1}{7}ac^6d^3x^7+\frac{3}{5}ac^4d^3x^5-\frac{1}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2}}{c^8}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*a*c^6*d^3*x^7 + 3/5*a*c^4*d^3*x^5 - 1/245*(35*x^7*arcsin(c*x) + (5*sqr
t(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^6*d^3 + 1/25*(15*x^5*arcsin(
c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqr
t(-c^2*x^2 + 1)/c^6)*c)*b*c^4*d^3 - a*c^2*d^3*x^3 - 1/3*(3*x^3*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d^3 + a*
d^3*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^3/c
```

Fricas [A] time = 2.19863, size = 367, normalized size = 2.1

$$-\frac{525\,ac^7d^3x^7 - 2205\,ac^5d^3x^5 + 3675\,ac^3d^3x^3 - 3675\,acd^3x + 105\left(5\,bc^7d^3x^7 - 21\,bc^5d^3x^5 + 35\,bc^3d^3x^3 - 35\,bcd^3x\right)\text{ar}}{3675\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*(525*a*c^7*d^3*x^7 - 2205*a*c^5*d^3*x^5 + 3675*a*c^3*d^3*x^3 - 3675
*a*c*d^3*x + 105*(5*b*c^7*d^3*x^7 - 21*b*c^5*d^3*x^5 + 35*b*c^3*d^3*x^3 - 3
5*b*c*d^3*x)*arcsin(c*x) + (75*b*c^6*d^3*x^6 - 351*b*c^4*d^3*x^4 + 757*b*c^
2*d^3*x^2 - 2161*b*d^3)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] time = 20.5782, size = 221, normalized size = 1.26

$$\begin{cases} -\frac{ac^6d^3x^7}{7} + \frac{3ac^4d^3x^5}{5} - ac^2d^3x^3 + ad^3x - \frac{bc^6d^3x^7\operatorname{asin}(cx)}{7} - \frac{bc^5d^3x^6\sqrt{-c^2x^2+1}}{49} + \frac{3bc^4d^3x^5\operatorname{asin}(cx)}{5} + \frac{117bc^3d^3x^4\sqrt{-c^2x^2+1}}{1225} - bc^2d^3x^3 \\ ad^3x \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**7/7 + 3*a*c**4*d**3*x**5/5 - a*c**2*d**3*x**3 +
a*d**3*x - b*c**6*d**3*x**7*asin(c*x)/7 - b*c**5*d**3*x**6*sqrt(-c**2*x**2
+ 1)/49 + 3*b*c**4*d**3*x**5*asin(c*x)/5 + 117*b*c**3*d**3*x**4*sqrt(-c**2*
x**2 + 1)/1225 - b*c**2*d**3*x**3*asin(c*x) - 757*b*c*d**3*x**2*sqrt(-c**2*
x**2 + 1)/3675 + b*d**3*x*asin(c*x) + 2161*b*d**3*sqrt(-c**2*x**2 + 1)/(367
5*c), Ne(c, 0)), (a*d**3*x, True))
```

Giac [A] time = 1.235, size = 302, normalized size = 1.73

$$-\frac{1}{7}\,ac^6d^3x^7 + \frac{3}{5}\,ac^4d^3x^5 - ac^2d^3x^3 - \frac{1}{7}\left(c^2x^2-1\right)^3bd^3x\arcsin(cx) + \frac{6}{35}\left(c^2x^2-1\right)^2bd^3x\arcsin(cx) - \frac{8}{35}\left(c^2x^2-1\right)bc$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/7*a*c^6*d^3*x^7 + 3/5*a*c^4*d^3*x^5 - a*c^2*d^3*x^3 - 1/7*(c^2*x^2 - 1)^
3*b*d^3*x*arcsin(c*x) + 6/35*(c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x) - 8/35*(c^
```

```
2*x^2 - 1)*b*d^3*x*arcsin(c*x) - 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*
d^3/c + 16/35*b*d^3*x*arcsin(c*x) + 6/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1
)*b*d^3/c + a*d^3*x + 8/105*(-c^2*x^2 + 1)^(3/2)*b*d^3/c + 16/35*sqrt(-c^2*
x^2 + 1)*b*d^3/c
```

3.24 $\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=235

$$-\frac{1}{2}ibd^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d^3\left(1-c^2x^2\right.$$

```
[Out] (-19*b*c*d^3*x*Sqrt[1 - c^2*x^2])/48 - (7*b*c*d^3*x*(1 - c^2*x^2)^(3/2))/72
 - (b*c*d^3*x*(1 - c^2*x^2)^(5/2))/36 - (19*b*d^3*ArcSin[c*x])/48 + (d^3*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
]))/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/6 - ((I/2)*d^3*(a + b*Arc
Sin[c*x])^2)/b + d^3*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (
I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.283025, antiderivative size = 235, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4683, 4625, 3717, 2190, 2279, 2391, 195, 216}

$$-\frac{1}{2}ibd^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d^3\left(1-c^2x^2\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-19*b*c*d^3*x*Sqrt[1 - c^2*x^2])/48 - (7*b*c*d^3*x*(1 - c^2*x^2)^(3/2))/72
 - (b*c*d^3*x*(1 - c^2*x^2)^(5/2))/36 - (19*b*d^3*ArcSin[c*x])/48 + (d^3*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
]))/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/6 - ((I/2)*d^3*(a + b*Arc
Sin[c*x])^2)/b + d^3*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (
I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = \frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)+d\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x}\,dx-\frac{1}{6}\left(bcd\right.$$

$$= -\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}+\frac{1}{4}d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+\right.$$

$$= -\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}+\frac{1}{2}d^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}-\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}+\frac{1}{2}d^3\left(1-c^2\right.$$

$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}-\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}-\frac{19}{48}bd^3\sin$$

$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}-\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}-\frac{19}{48}bd^3\sin$$

$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}-\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}-\frac{19}{48}bd^3\sin$$

$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}-\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}-\frac{19}{48}bd^3\sin$$

Mathematica [A] time = 0.210419, size = 183, normalized size = 0.78

$$-\frac{1}{144}d^3\left(72ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+24ac^6x^6-108ac^4x^4+216ac^2x^2-144a\log(x)+4bc^5x^5\sqrt{1-c^2x^2}-22bc^3x^3\sqrt{1-\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -(d^3*(216*a*c^2*x^2 - 108*a*c^4*x^4 + 24*a*c^6*x^6 + 75*b*c*x*Sqrt[1 - c^2
*x^2] - 22*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 4*b*c^5*x^5*Sqrt[1 - c^2*x^2] + (7
2*I)*b*ArcSin[c*x]^2 + 3*b*ArcSin[c*x]*(-25 + 72*c^2*x^2 - 36*c^4*x^4 + 8*c
^6*x^6 - 48*Log[1 - E^((2*I)*ArcSin[c*x])]) - 144*a*Log[x] + (72*I)*b*PolyL
og[2, E^((2*I)*ArcSin[c*x])]))/144
```

Maple [A] time = 0.275, size = 302, normalized size = 1.3

$$-\frac{d^3ac^6x^6}{6}+\frac{3\,d^3ac^4x^4}{4}-\frac{3\,d^3ac^2x^2}{2}+d^3a\ln(cx)+\frac{3\,d^3b\arcsin(cx)\,c^4x^4}{4}-\frac{3\,d^3b\arcsin(cx)\,c^2x^2}{2}-\frac{d^3b\arcsin(cx)\,c^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x)
```

```
[Out] -1/6*d^3*a*c^6*x^6+3/4*d^3*a*c^4*x^4-3/2*d^3*a*c^2*x^2+d^3*a*ln(c*x)+3/4*d^
3*b*arcsin(c*x)*c^4*x^4-3/2*d^3*b*arcsin(c*x)*c^2*x^2-1/6*d^3*b*arcsin(c*x)
*c^6*x^6+25/48*b*d^3*arcsin(c*x)-I*d^3*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)
)-I*d^3*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*I*b*d^3*arcsin(c*x)^2+d^
3*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+d^3*b*arcsin(c*x)*ln(1-I*c*x
-(-c^2*x^2+1)^(1/2))-1/36*d^3*b*(-c^2*x^2+1)^(1/2)*c^5*x^5+11/72*d^3*b*(-c^
2*x^2+1)^(1/2)*c^3*x^3-25/48*b*c*d^3*x*(-c^2*x^2+1)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{6}\,ac^6d^3x^6+\frac{3}{4}\,ac^4d^3x^4-\frac{3}{2}\,ac^2d^3x^2+ad^3\log(x)-\int\frac{\left(bc^6d^3x^6-3\,bc^4d^3x^4+3\,bc^2d^3x^2-bd^3\right)\arctan\left(cx,\sqrt{cx+1}\right.}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] -1/6*a*c^6*d^3*x^6 + 3/4*a*c^4*d^3*x^4 - 3/2*a*c^2*d^3*x^2 + a*d^3*log(x) -
 integrate((b*c^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{ac^6d^3x^6-3\,ac^4d^3x^4+3\,ac^2d^3x^2-ad^3+\left(bc^6d^3x^6-3\,bc^4d^3x^4+3\,bc^2d^3x^2-bd^3\right)\arcsin(cx)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d^3\left(\int -\frac{a}{x}\,dx + \int 3ac^2x\,dx + \int -3ac^4x^3\,dx + \int ac^6x^5\,dx + \int -\frac{b\operatorname{asin}(cx)}{x}\,dx + \int 3bc^2x\operatorname{asin}(cx)\,dx + \int -3bc^4x^3\operatorname{as}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x,x)
```

```
[Out] -d**3*(Integral(-a/x, x) + Integral(3*a*c**2*x, x) + Integral(-3*a*c**4*x**
3, x) + Integral(a*c**6*x**5, x) + Integral(-b*asin(c*x)/x, x) + Integral(3
*b*c**2*x*asin(c*x), x) + Integral(-3*b*c**4*x**3*asin(c*x), x) + Integral(
b*c**6*x**5*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2 - d\right)^3 (b\arcsin(cx) + a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)/x, x)
```

3.25 $\int \frac{(d-c^2dx^2)^3(a+b\sin^{-1}(cx))}{x^2}\,dx$

Optimal. Leaf size=164

$$-\frac{1}{5}c^6d^3x^5\left(a+b\sin^{-1}(cx)\right)+c^4d^3x^3\left(a+b\sin^{-1}(cx)\right)-3c^2d^3x\left(a+b\sin^{-1}(cx)\right)-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{25}bcd^3\left(1-\right.$$

```
[Out] (-11*b*c*d^3*Sqrt[1 - c^2*x^2])/5 - (b*c*d^3*(1 - c^2*x^2)^(3/2))/5 - (b*c*
d^3*(1 - c^2*x^2)^(5/2))/25 - (d^3*(a + b*ArcSin[c*x]))/x - 3*c^2*d^3*x*(a
+ b*ArcSin[c*x]) + c^4*d^3*x^3*(a + b*ArcSin[c*x]) - (c^6*d^3*x^5*(a + b*Ar
cSin[c*x]))/5 - b*c*d^3*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rubi [A] time = 0.23118, antiderivative size = 164, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {270, 4687, 12, 1799, 1620, 63, 208}

$$-\frac{1}{5}c^6d^3x^5\left(a+b\sin^{-1}(cx)\right)+c^4d^3x^3\left(a+b\sin^{-1}(cx)\right)-3c^2d^3x\left(a+b\sin^{-1}(cx)\right)-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{25}bcd^3\left(1-\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-11*b*c*d^3*Sqrt[1 - c^2*x^2])/5 - (b*c*d^3*(1 - c^2*x^2)^(3/2))/5 - (b*c*
d^3*(1 - c^2*x^2)^(5/2))/25 - (d^3*(a + b*ArcSin[c*x]))/x - 3*c^2*d^3*x*(a
+ b*ArcSin[c*x]) + c^4*d^3*x^3*(a + b*ArcSin[c*x]) - (c^6*d^3*x^5*(a + b*Ar
cSin[c*x]))/5 - b*c*d^3*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x} - 3c^2d^3x\left(a+b\sin^{-1}(cx)\right) + c^4d^3x^3\left(a+b\sin^{-1}(cx)\right) - \frac{1}{5}c^6d$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x} - 3c^2d^3x\left(a+b\sin^{-1}(cx)\right) + c^4d^3x^3\left(a+b\sin^{-1}(cx)\right) - \frac{1}{5}c^6d$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x} - 3c^2d^3x\left(a+b\sin^{-1}(cx)\right) + c^4d^3x^3\left(a+b\sin^{-1}(cx)\right) - \frac{1}{5}c^6d$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x} - 3c^2d^3x\left(a+b\sin^{-1}(cx)\right) + c^4d^3x^3\left(a+b\sin^{-1}(cx)\right) - \frac{1}{5}c^6d$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2} - \frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2} - \frac{d^3\left(a+b\sin^{-1}(c\right.}{x}$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2} - \frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2} - \frac{d^3\left(a+b\sin^{-1}(c\right.}{x}$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2} - \frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2} - \frac{d^3\left(a+b\sin^{-1}(c\right.}{x}$$

Mathematica [A] time = 0.112286, size = 166, normalized size = 1.01

$$-\frac{d^3\left(5ac^6x^6 - 25ac^4x^4 + 75ac^2x^2 + 25a + bc^5x^5\sqrt{1-c^2x^2} - 7bc^3x^3\sqrt{1-c^2x^2} + 61bcx\sqrt{1-c^2x^2} + 25bcx\log\left(\sqrt{1-c^2x^2}\right.\right.}{25x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -(d^3*(25*a + 75*a*c^2*x^2 - 25*a*c^4*x^4 + 5*a*c^6*x^6 + 61*b*c*x*Sqrt[1 -
 c^2*x^2] - 7*b*c^3*x^3*Sqrt[1 - c^2*x^2] + b*c^5*x^5*Sqrt[1 - c^2*x^2] + 5
*b*(5 + 15*c^2*x^2 - 5*c^4*x^4 + c^6*x^6)*ArcSin[c*x] - 25*b*c*x*Log[x] + 2
5*b*c*x*Log[1 + Sqrt[1 - c^2*x^2]]))/(25*x)
```

Maple [A] time = 0.006, size = 155, normalized size = 1.

$$c\left(-d^{3}a\left(\frac{c^{5}x^{5}}{5}-c^{3}x^{3}+3\,cx+\frac{1}{cx}\right)-d^{3}b\left(\frac{\arcsin\left(cx\right)c^{5}x^{5}}{5}-c^{3}x^{3}\arcsin\left(cx\right)+3\,cx\arcsin\left(cx\right)+\frac{\arcsin\left(cx\right)}{cx}+\frac{c^{4}x^{4}}{25}\sqrt{\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] c*(-d^3*a*(1/5*c^5*x^5-c^3*x^3+3*c*x+1/c/x)-d^3*b*(1/5*arcsin(c*x)*c^5*x^5-
c^3*x^3*arcsin(c*x)+3*c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+1/25*c^4*x^4*(-c^2*
x^2+1)^(1/2)-7/25*c^2*x^2*(-c^2*x^2+1)^(1/2)+61/25*(-c^2*x^2+1)^(1/2)+arcta
nh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.6, size = 338, normalized size = 2.06

$$-\frac{1}{5}\,ac^{6}d^{3}x^{5}-\frac{1}{75}\left(15\,x^{5}\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^{2}x^{2}+1}x^{4}}{c^{2}}+\frac{4\,\sqrt{-c^{2}x^{2}+1}x^{2}}{c^{4}}+\frac{8\,\sqrt{-c^{2}x^{2}+1}}{c^{6}}\right)c\right)bc^{6}d^{3}+ac^{4}d^{3}x^{3}+\frac{1}{3}\left(3\,x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -1/5*a*c^6*d^3*x^5 - 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c
^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^6*d^3
+ a*c^4*d^3*x^3 + 1/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^4*d^3 - 3*a*c^2*d^3*x - 3*(c*x*arcsin(c*x) +
 sqrt(-c^2*x^2 + 1))*b*c*d^3 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x
)) + arcsin(c*x)/x)*b*d^3 - a*d^3/x
```

Fricas [A] time = 2.81481, size = 427, normalized size = 2.6

$$-\frac{10\,ac^{6}d^{3}x^{6}-50\,ac^{4}d^{3}x^{4}+150\,ac^{2}d^{3}x^{2}+25\,bcd^{3}x\log\left(\sqrt{-c^{2}x^{2}+1}+1\right)-25\,bcd^{3}x\log\left(\sqrt{-c^{2}x^{2}+1}-1\right)+50\,ad^{3}+}{50\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/50*(10*a*c^6*d^3*x^6 - 50*a*c^4*d^3*x^4 + 150*a*c^2*d^3*x^2 + 25*b*c*d^3
*x*log(sqrt(-c^2*x^2 + 1) + 1) - 25*b*c*d^3*x*log(sqrt(-c^2*x^2 + 1) - 1) +
 50*a*d^3 + 10*(b*c^6*d^3*x^6 - 5*b*c^4*d^3*x^4 + 15*b*c^2*d^3*x^2 + 5*b*d^
3)*arcsin(c*x) + 2*(b*c^5*d^3*x^5 - 7*b*c^3*d^3*x^3 + 61*b*c*d^3*x)*sqrt(-c
^2*x^2 + 1))/x
```

Sympy [A] time = 40.4781, size = 287, normalized size = 1.75

$$-\frac{ac^{6}d^{3}x^{5}}{5}+ac^{4}d^{3}x^{3}-3ac^{2}d^{3}x-\frac{ad^{3}}{x}+\frac{bc^{7}d^{3}\left(\begin{cases}-\frac{x^{4}\sqrt{-c^{2}x^{2}+1}}{5c^{2}}-\frac{4x^{2}\sqrt{-c^{2}x^{2}+1}}{15c^{4}}-\frac{8\sqrt{-c^{2}x^{2}+1}}{15c^{6}} & \text{for } c\neq 0\\ \frac{x^{6}}{6} & \text{otherwise}\end{cases}\right)}{5}-\frac{bc^{6}d^{3}x^{5}\operatorname{asin}\left(\right.}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*c**6*d**3*x**5/5 + a*c**4*d**3*x**3 - 3*a*c**2*d**3*x - a*d**3/x + b*c**
7*d**3*Piecewise((-x**4*sqrt(-c**2*x**2 + 1)/(5*c**2) - 4*x**2*sqrt(-c**2*x
**2 + 1)/(15*c**4) - 8*sqrt(-c**2*x**2 + 1)/(15*c**6), Ne(c, 0)), (x**6/6,
True))/5 - b*c**6*d**3*x**5*asin(c*x)/5 - b*c**5*d**3*Piecewise((-x**2*sqrt
(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c, 0)), (x*
*4/4, True)) + b*c**4*d**3*x**3*asin(c*x) - 3*b*c**2*d**3*Piecewise((0, Eq(
c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*c*d**3*Piecewise(
(-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*d**3*
asin(c*x)/x
```

Giac [B] time = 145.438, size = 7443, normalized size = 45.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^13*d^3*x^12*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 +
5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^
7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1/2*a*
c^13*d^3*x^12/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^
2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) + b*c^12*d^3*x^11*log(abs(c
)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^
2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - b*c^12*d^3*x^11*log(sqrt(-c^2
*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sq
rt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 61/25*b*c^12*d^3*x^11/((
c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^
9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1)
+ 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^11) - 9*b*c^11*d^3*x^10*arcsin(c*x)/((c^11*x^11
/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(
-c^2*x^2 + 1) + 1)^10) - 9*a*c^11*d^3*x^10/((c^11*x^11/(sqrt(-c^2*x^2 + 1)
+ 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2
+ 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*
x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10
) + 5*b*c^10*d^3*x^9*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1
)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1
) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2
 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) -
5*b*c^10*d^3*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1
) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^
2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^
```

```
9) + 31/5*b*c^10*d^3*x^9/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^
9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c
^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 47/2*b*c^9*d^3*
x^8*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-
c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(s
qrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt
(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 47/2*a*c^9*d^3*x^8/((c^1
1*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1
)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*
(sqrt(-c^2*x^2 + 1) + 1)^8) + 10*b*c^8*d^3*x^7*log(abs(c)*abs(x))/((c^11*x^
11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*
c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
+ 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr
t(-c^2*x^2 + 1) + 1)^7) - 10*b*c^8*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^
11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9
+ 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
*(sqrt(-c^2*x^2 + 1) + 1)^7) + 22/5*b*c^8*d^3*x^7/((c^11*x^11/(sqrt(-c^2*x^
2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c
^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqr
t(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
+ 1)^7) - 182/5*b*c^7*d^3*x^6*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) +
 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6)
- 182/5*a*c^7*d^3*x^6/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(
sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*
x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x
/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 10*b*c^6*d^3*x^5*l
og(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt
(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sq
rt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 10*b*c^6*d^3*x^5*log(s
qrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/
(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 22/5*b*c^6*d^3*x^
5/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) +
 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 +
 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1)
 + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 47/2*b*c^5*d^3*x^4*arcsin(c*x)/((c^11*
x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 1
0*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^
5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^4) - 47/2*a*c^5*d^3*x^4/((c^11*x^11/(sqrt(-c^2*x^2 +
 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*
x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^4) + 5*b*c^4*d^3*x^3*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) +
 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3)
- 5*b*c^4*d^3*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 +
1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x
^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c
^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)
^3) - 31/5*b*c^4*d^3*x^3/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^
```

```
9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c
^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 9*b*c^3*d^3*x^2
*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2
*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c
^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 9*a*c^3*d^3*x^2/((c^11*x^11
/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(
-c^2*x^2 + 1) + 1)^2) + b*c^2*d^3*x*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c
^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sq
rt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2
+ 1) + 1)) - b*c^2*d^3*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2
*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(
sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)) - 61/25*b*c^2*d^3*x/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^
9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 +
10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d^3*a
rcsin(c*x)/(c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^
2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1)) - 1/2*a*c*d^3/(c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9
*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 1
0*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
```

3.26 $\int \frac{(d-c^2dx^2)^3(a+b\sin^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=263

$$\frac{3}{2}ibc^2d^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}-\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)-\frac{3}{2}c^2d^3\left(1-c\right.$$

```
[Out] (3*b*c^3*d^3*x*Sqrt[1 - c^2*x^2])/32 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2))/
16 - (b*c*d^3*(1 - c^2*x^2)^(5/2))/(2*x) + (3*b*c^2*d^3*ArcSin[c*x])/32 - (
3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 - (3*c^2*d^3*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/4 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(2*x^2)
 + (((3*I)/2)*c^2*d^3*(a + b*ArcSin[c*x])^2)/b - 3*c^2*d^3*(a + b*ArcSin[c*
x])*Log[1 - E^((2*I)*ArcSin[c*x])] + ((3*I)/2)*b*c^2*d^3*PolyLog[2, E^((2*I
)*ArcSin[c*x])]
```

Rubi [A] time = 0.298457, antiderivative size = 263, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4685, 277, 195, 216, 4683, 4625, 3717, 2190, 2279, 2391}

$$\frac{3}{2}ibc^2d^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}-\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)-\frac{3}{2}c^2d^3\left(1-c\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```


```
[Out] (3*b*c^3*d^3*x*Sqrt[1 - c^2*x^2])/32 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2))/
16 - (b*c*d^3*(1 - c^2*x^2)^(5/2))/(2*x) + (3*b*c^2*d^3*ArcSin[c*x])/32 - (
3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 - (3*c^2*d^3*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/4 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(2*x^2)
 + (((3*I)/2)*c^2*d^3*(a + b*ArcSin[c*x])^2)/b - 3*c^2*d^3*(a + b*ArcSin[c*
x])*Log[1 - E^((2*I)*ArcSin[c*x])] + ((3*I)/2)*b*c^2*d^3*PolyLog[2, E^((2*I
)*ArcSin[c*x])]
```


Rule 4685

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcSin[c*x
]))/(f*(m + 1)), x] + (-Dist[(b*c*d^p)/(f*(m + 1)), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx = -\frac{d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{2x^2} - \left(3c^2d\right)\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x}\,dx$$

$$= -\frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right) - \frac{d^3\left(1-c^2x^2\right)^3\left(a+\right.}{2x^2}$$

$$= -\frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} - \frac{3}{2}c^2d^3\left(1-\right.$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\,\mathrm{si}$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\,\mathrm{si}$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\,\mathrm{si}$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\,\mathrm{si}$$

Mathematica [A] time = 0.178301, size = 203, normalized size = 0.77

$$-\frac{d^3\left(-48ibc^2x^2\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+8ac^6x^6-48ac^4x^4+96ac^2x^2\log(x)+16a+2bc^5x^5\sqrt{1-c^2x^2}-21bc^3x^3\sqrt{1-\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(d^3*(16*a - 48*a*c^4*x^4 + 8*a*c^6*x^6 + 16*b*c*x*Sqrt[1 - c^2*x^2] - 21*
b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*c^5*x^5*Sqrt[1 - c^2*x^2] - (48*I)*b*c^2*
x^2*ArcSin[c*x]^2 + b*ArcSin[c*x]*(16 + 21*c^2*x^2 - 48*c^4*x^4 + 8*c^6*x^6
 + 96*c^2*x^2*Log[1 - E^((2*I)*ArcSin[c*x])]) + 96*a*c^2*x^2*Log[x] - (48*I
)*b*c^2*x^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(32*x^2)
```

Maple [A] time = 0.473, size = 330, normalized size = 1.3

$$-\frac{c^6d^3ax^4}{4}+\frac{3c^4d^3ax^2}{2}-\frac{d^3a}{2x^2}-3c^2d^3a\ln(cx)-\frac{bd^3\arcsin(cx)}{2x^2}-\frac{c^6d^3b\arcsin(cx)x^4}{4}+\frac{3c^4d^3b\arcsin(cx)x^2}{2}-\frac{21\,b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] -1/4*c^6*d^3*a*x^4+3/2*c^4*d^3*a*x^2-1/2*d^3*a/x^2-3*c^2*d^3*a*ln(c*x)-1/2*
d^3*b*arcsin(c*x)/x^2-1/4*c^6*d^3*b*arcsin(c*x)*x^4+3/2*c^4*d^3*b*arcsin(c*
x)*x^2-21/32*b*c^2*d^3*arcsin(c*x)+3*I*c^2*d^3*b*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))-1/2*b*c*d^3*(-c^2*x^2+1)^(1/2)/x+1/2*I*c^2*d^3*b-3*c^2*d^3*b*arc
sin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+3*I*c^2*d^3*b*polylog(2,I*c*x+(-c^2
*x^2+1)^(1/2))-3*c^2*d^3*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/16*
c^5*d^3*b*(-c^2*x^2+1)^(1/2)*x^3+21/32*b*c^3*d^3*x*(-c^2*x^2+1)^(1/2)+3/2*I
```

```
*c^2*d^3*b*arcsin(c*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}ac^6d^3x^4+\frac{3}{2}ac^4d^3x^2-3ac^2d^3\log(x)-\frac{1}{2}bd^3\left(\frac{\sqrt{-c^2x^2+1}c}{x}+\frac{\arcsin(cx)}{x^2}\right)-\frac{ad^3}{2x^2}-\int\frac{\left(bc^6d^3x^4-3bc^4d^3x^2+3bc^2d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*c^6*d^3*x^4 + 3/2*a*c^4*d^3*x^2 - 3*a*c^2*d^3*log(x) - 1/2*b*d^3*(sq
rt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a*d^3/x^2 - integrate((b*c^6*
d^3*x^4 - 3*b*c^4*d^3*x^2 + 3*b*c^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{ac^6d^3x^6-3ac^4d^3x^4+3ac^2d^3x^2-ad^3+\left(bc^6d^3x^6-3bc^4d^3x^4+3bc^2d^3x^2-bd^3\right)\arcsin(cx)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))/x^3, x
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d^3\left(\int-\frac{a}{x^3}\,dx+\int\frac{3ac^2}{x}\,dx+\int-3ac^4x\,dx+\int ac^6x^3\,dx+\int-\frac{b\operatorname{asin}(cx)}{x^3}\,dx+\int\frac{3bc^2\operatorname{asin}(cx)}{x}\,dx+\int-3bc^4x\operatorname{asin}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**3,x)
```

```
[Out] -d**3*(Integral(-a/x**3, x) + Integral(3*a*c**2/x, x) + Integral(-3*a*c**4*
x, x) + Integral(a*c**6*x**3, x) + Integral(-b*asin(c*x)/x**3, x) + Integra
l(3*b*c**2*asin(c*x)/x, x) + Integral(-3*b*c**4*x*asin(c*x), x) + Integral(
b*c**6*x**3*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int-\frac{\left(c^2dx^2-d\right)^3(b\arcsin(cx)+a)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)/x^3, x)
```

3.27 $\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=178

$$-\frac{1}{3}c^6d^3x^3\left(a+b\sin^{-1}(cx)\right)+3c^4d^3x\left(a+b\sin^{-1}(cx)\right)+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{1}{9}bc^3d^3\left(1-c^2x\right.$$

```
[Out] (8*b*c^3*d^3*Sqrt[1 - c^2*x^2])/3 - (b*c*d^3*Sqrt[1 - c^2*x^2])/(6*x^2) + (
b*c^3*d^3*(1 - c^2*x^2)^(3/2))/9 - (d^3*(a + b*ArcSin[c*x]))/(3*x^3) + (3*c
^2*d^3*(a + b*ArcSin[c*x]))/x + 3*c^4*d^3*x*(a + b*ArcSin[c*x]) - (c^6*d^3*
x^3*(a + b*ArcSin[c*x]))/3 + (17*b*c^3*d^3*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rubi [A] time = 0.251276, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {270, 4687, 12, 1799, 1621, 897, 1153, 208}

$$-\frac{1}{3}c^6d^3x^3\left(a+b\sin^{-1}(cx)\right)+3c^4d^3x\left(a+b\sin^{-1}(cx)\right)+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{1}{9}bc^3d^3\left(1-c^2x\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```


```
[Out] (8*b*c^3*d^3*Sqrt[1 - c^2*x^2])/3 - (b*c*d^3*Sqrt[1 - c^2*x^2])/(6*x^2) + (
b*c^3*d^3*(1 - c^2*x^2)^(3/2))/9 - (d^3*(a + b*ArcSin[c*x]))/(3*x^3) + (3*c
^2*d^3*(a + b*ArcSin[c*x]))/x + 3*c^4*d^3*x*(a + b*ArcSin[c*x]) - (c^6*d^3*
x^3*(a + b*ArcSin[c*x]))/3 + (17*b*c^3*d^3*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1621

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :
> With[{Qx = PolynomialQuotient[Px, a + b*x, x], R = PolynomialRemainder[Px
, a + b*x, x]}, Simp[(R*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((m + 1)*(b*c
- a*d)), x] + Dist[1/((m + 1)*(b*c - a*d)), Int[(a + b*x)^(m + 1)*(c + d*x)
^n*ExpandToSum[(m + 1)*(b*c - a*d)*Qx - d*R*(m + n + 2), x], x], x]] /; Fre
eQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[m, -1] && GtQ[Expon[Px, x],
2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx = -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}+3c^4d^3x\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}+3c^4d^3x\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}+3c^4d^3x\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}+3c^4d^3x\left(a+\right.$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}+3c^4d^3x\left(a+\right.$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\sin^{-1}(cx)\right)}{x}+3c^4d^3x\left(a+\right.$$

$$= \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}+\frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}-\frac{d^3\left(a+b\sin^{-1}(cx)\right.}{3x^3}$$

$$= \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}+\frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}-\frac{d^3\left(a+b\sin^{-1}(cx)\right.}{3x^3}$$

Mathematica [A] time = 0.15279, size = 175, normalized size = 0.98

$$-\frac{d^3\left(6ac^6x^6-54ac^4x^4-54ac^2x^2+6a+2bc^5x^5\sqrt{1-c^2x^2}-50bc^3x^3\sqrt{1-c^2x^2}+3bcx\sqrt{1-c^2x^2}+51bc^3x^3\log(x)-51bc^3\right.}{18x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -(d^3*(6*a - 54*a*c^2*x^2 - 54*a*c^4*x^4 + 6*a*c^6*x^6 + 3*b*c*x*Sqrt[1 - c
^2*x^2] - 50*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*c^5*x^5*Sqrt[1 - c^2*x^2] +
6*b*(1 - 9*c^2*x^2 - 9*c^4*x^4 + c^6*x^6)*ArcSin[c*x] + 51*b*c^3*x^3*Log[x]
 - 51*b*c^3*x^3*Log[1 + Sqrt[1 - c^2*x^2]]))/(18*x^3)
```

Maple [A] time = 0.01, size = 161, normalized size = 0.9

$$c^3\left(-d^3a\left(\frac{c^3x^3}{3}-3\,cx-3\,\frac{1}{cx}+\frac{1}{3\,c^3x^3}\right)-d^3b\left(\frac{c^3x^3\arcsin(cx)}{3}-3\,cx\arcsin(cx)-3\,\frac{\arcsin(cx)}{cx}+\frac{\arcsin(cx)}{3\,c^3x^3}+\frac{c^2x^2}{9}\sqrt{\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] c^3*(-d^3*a*(1/3*c^3*x^3-3*c*x-3/c/x+1/3/c^3/x^3)-d^3*b*(1/3*c^3*x^3*arcsin
(c*x)-3*c*x*arcsin(c*x)-3/c/x*arcsin(c*x)+1/3/c^3/x^3*arcsin(c*x)+1/9*c^2*x
^2*(-c^2*x^2+1)^(1/2)-25/9*(-c^2*x^2+1)^(1/2)-17/6*arctanh(1/(-c^2*x^2+1)^(
1/2))+1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.56809, size = 327, normalized size = 1.84

$$-\frac{1}{3}\,ac^6d^3x^3-\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^6d^3+3\,ac^4d^3x+3\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*a*c^6*d^3*x^3 - 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^6*d^3 + 3*a*c^4*d^3*x + 3*(c*x*arcsin(c*x
) + sqrt(-c^2*x^2 + 1))*b*c^3*d^3 + 3*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) +
2/abs(x)) + arcsin(c*x)/x)*b*c^2*d^3 - 1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/a
bs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^3 +
3*a*c^2*d^3/x - 1/3*a*d^3/x^3
```

Fricas [A] time = 2.80443, size = 440, normalized size = 2.47

$$-\frac{12\,ac^6d^3x^6-108\,ac^4d^3x^4-51\,bc^3d^3x^3\log\left(\sqrt{-c^2x^2+1}+1\right)+51\,bc^3d^3x^3\log\left(\sqrt{-c^2x^2+1}-1\right)-108\,ac^2d^3x^2+12\,ad^3}{36\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/36*(12*a*c^6*d^3*x^6 - 108*a*c^4*d^3*x^4 - 51*b*c^3*d^3*x^3*log(sqrt(-c^
2*x^2 + 1) + 1) + 51*b*c^3*d^3*x^3*log(sqrt(-c^2*x^2 + 1) - 1) - 108*a*c^2*
d^3*x^2 + 12*a*d^3 + 12*(b*c^6*d^3*x^6 - 9*b*c^4*d^3*x^4 - 9*b*c^2*d^3*x^2
+ b*d^3)*arcsin(c*x) + 2*(2*b*c^5*d^3*x^5 - 50*b*c^3*d^3*x^3 + 3*b*c*d^3*x)
*sqrt(-c^2*x^2 + 1))/x^3
```

Sympy [A] time = 17.5578, size = 326, normalized size = 1.83

$$-\frac{ac^6d^3x^3}{3} + 3ac^4d^3x + \frac{3ac^2d^3}{x} - \frac{ad^3}{3x^3} + \frac{bc^7d^3\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for } c \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3} - \frac{bc^6d^3x^3\operatorname{asin}(cx)}{3} + 3bc^4d^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*c**6*d**3*x**3/3 + 3*a*c**4*d**3*x + 3*a*c**2*d**3/x - a*d**3/(3*x**3) +
 b*c**7*d**3*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*
x**2 + 1)/(3*c**4), Ne(c, 0)), (x**4/4, True))/3 - b*c**6*d**3*x**3*asin(c*
x)/3 + 3*b*c**4*d**3*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**
2 + 1)/c, True)) - 3*b*c**3*d**3*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**
2) > 1), (I*asin(1/(c*x)), True)) + 3*b*c**2*d**3*asin(c*x)/x + b*c*d**3*Pi
ecewise((-c**2*acosh(1/(c*x))/2 - c*sqrt(-1 + 1/(c**2*x**2))/(2*x), 1/Abs(c
**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c/(2*x*sqrt(1 - 1/(c**2*x**2)))
 + I/(2*c*x**3*sqrt(1 - 1/(c**2*x**2))), True))/3 - b*d**3*asin(c*x)/(3*x**
3)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

3.28 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx$

Optimal. Leaf size=172

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^5d}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^5d}-\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{2i\tan^{-1}\left(e^{i\sin^{-1}(c\ldots}\right.}{\ldots}$$

```
[Out] (-4*b*Sqrt[1 - c^2*x^2])/(3*c^5*d) + (b*(1 - c^2*x^2)^(3/2))/(9*c^5*d) - (x
*(a + b*ArcSin[c*x]))/(c^4*d) - (x^3*(a + b*ArcSin[c*x]))/(3*c^2*d) - ((2*I
)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d) + (I*b*PolyLog[2,
(-I)*E^(I*ArcSin[c*x])])/(c^5*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c
^5*d)
```

Rubi [A] time = 0.237931, antiderivative size = 172, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4715, 4657, 4181, 2279, 2391, 261, 266, 43}

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^5d}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^5d}-\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{2i\tan^{-1}\left(e^{i\sin^{-1}(c\ldots}\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```


```
[Out] (-4*b*Sqrt[1 - c^2*x^2])/(3*c^5*d) + (b*(1 - c^2*x^2)^(3/2))/(9*c^5*d) - (x
*(a + b*ArcSin[c*x]))/(c^4*d) - (x^3*(a + b*ArcSin[c*x]))/(3*c^2*d) - ((2*I
)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d) + (I*b*PolyLog[2,
(-I)*E^(I*ArcSin[c*x])])/(c^5*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c
^5*d)
```


Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx = -\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}+\frac{\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx}{c^2}+\frac{b\int \frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{3cd}$$

$$= -\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}+\frac{\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{c^4}+\frac{b\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{c^3d}+\frac{b\,\text{Subs}}{}$$

$$= -\frac{b\sqrt{1-c^2x^2}}{c^5d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}+\frac{\text{Subst}\left(\int(a+bx)\sec(x)\,dx,\right.}{c^5d}$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d}+\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^5d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{2i\left(a+b\,\text{s}\right.}{}$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d}+\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^5d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{2i\left(a+b\,\text{s}\right.}{}$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d}+\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^5d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{2i\left(a+b\,\text{s}\right.}{}$$

Mathematica [A] time = 0.304937, size = 286, normalized size = 1.66

$$-\frac{-18ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+18ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+6ac^3x^3+18acx+9a\log(1-cx)-9a\log(cx+1)+}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -(18*a*c*x + 6*a*c^3*x^3 + 22*b*Sqrt[1 - c^2*x^2] + 2*b*c^2*x^2*Sqrt[1 - c^
2*x^2] + (9*I)*b*Pi*ArcSin[c*x] + 18*b*c*x*ArcSin[c*x] + 6*b*c^3*x^3*ArcSin
[c*x] - 9*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 18*b*ArcSin[c*x]*Log[1 - I*E^
(I*ArcSin[c*x])] - 9*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 18*b*ArcSin[c*x]*L
og[1 + I*E^(I*ArcSin[c*x])] + 9*a*Log[1 - c*x] - 9*a*Log[1 + c*x] + 9*b*Pi*
Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 9*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
 - (18*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (18*I)*b*PolyLog[2, I*E^(I
*ArcSin[c*x])])/(18*c^5*d)
```

Maple [A] time = 0.253, size = 270, normalized size = 1.6

$$-\frac{ax^3}{3\,c^2d}-\frac{ax}{c^4d}-\frac{a\ln(cx-1)}{2\,c^5d}+\frac{a\ln(cx+1)}{2\,c^5d}-\frac{b\arcsin(cx)\,x^3}{3\,c^2d}-\frac{b\arcsin(cx)\,x}{c^4d}-\frac{ib}{c^5d}\mathrm{dilog}\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

```
[Out] -1/3/c^2*a/d*x^3-1/c^4*a/d*x-1/2/c^5*a/d*ln(c*x-1)+1/2/c^5*a/d*ln(c*x+1)-1/
3/c^2*b/d*arcsin(c*x)*x^3-1/c^4*b/d*arcsin(c*x)*x-I/c^5*b/d*dilog(1-I*(I*c*
x+(-c^2*x^2+1)^(1/2)))-1/9/c^3*b/d*(-c^2*x^2+1)^(1/2)*x^2-11/9*b*(-c^2*x^2+
1)^(1/2)/c^5/d-1/c^5*b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/c
^5*b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I/c^5*b/d*dilog(1+I*(
I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{6}\,a\left(\frac{2\left(c^2x^3+3\,x\right)}{c^4d}-\frac{3\,\log(cx+1)}{c^5d}+\frac{3\,\log(cx-1)}{c^5d}\right)+\frac{-\frac{1}{3}\left(c^5d\left(\frac{2\left(c^2x^2+2\right)\sqrt{cx+1}\sqrt{-cx+1}}{c^5d}+\frac{18\sqrt{cx+1}\sqrt{-cx+1}}{c^5d}+3\int-\frac{3\sqrt{cx+1}\sqrt{-}}{}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/6*a*(2*(c^2*x^3 + 3*x)/(c^4*d) - 3*log(c*x + 1)/(c^5*d) + 3*log(c*x - 1)
/(c^5*d)) + 1/6*(6*c^5*d*integrate(-1/6*(2*c^3*x^3 + 6*c*x - 3*log(c*x + 1)
 + 3*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d*x^2 - c^4*d), x) -
2*(c^3*x^3 + 3*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 3*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^5*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{bx^4\arcsin(cx)+ax^4}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{ax^4}{c^2x^2-1}\,dx + \int \frac{bx^4\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**4/(c**2*x**2 - 1), x) + Integral(b*x**4*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx) + a)x^4}{c^2dx^2 - d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d), x)
```

3.29 $\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx$

Optimal. Leaf size=144

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d}+\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d}-\frac{\log\left(1+e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{bx\sqrt{1}}{4}$$

```
[Out] -(b*x*Sqrt[1 - c^2*x^2])/(4*c^3*d) + (b*ArcSin[c*x])/(4*c^4*d) - (x^2*(a +
b*ArcSin[c*x]))/(2*c^2*d) + ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^4*d) - ((a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^4*d) + ((I/2)*b*PolyLog[
2, -E^((2*I)*ArcSin[c*x])])/(c^4*d)
```

Rubi [A] time = 0.188384, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4715, 4675, 3719, 2190, 2279, 2391, 321, 216}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d}+\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d}-\frac{\log\left(1+e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{bx\sqrt{1}}{4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```


```
[Out] -(b*x*Sqrt[1 - c^2*x^2])/(4*c^3*d) + (b*ArcSin[c*x])/(4*c^4*d) - (x^2*(a +
b*ArcSin[c*x]))/(2*c^2*d) + ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^4*d) - ((a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^4*d) + ((I/2)*b*PolyLog[
2, -E^((2*I)*ArcSin[c*x])])/(c^4*d)
```


Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx = -\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx}{c^2} + \frac{b\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2cd}$$

$$= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d} - \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(cx)\right)}{c^4d} + \frac{b\int}{}$$

$$= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d} + \frac{b\sin^{-1}(cx)}{4c^4d} - \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d} - \frac{(2i)\,\text{Subst}\Big(}{}$$

$$= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d} + \frac{b\sin^{-1}(cx)}{4c^4d} - \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d} - \frac{\left(a+b\sin^{-1}(\right.}{}$$

$$= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d} + \frac{b\sin^{-1}(cx)}{4c^4d} - \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d} - \frac{\left(a+b\sin^{-1}(\right.}{}$$

$$= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d} + \frac{b\sin^{-1}(cx)}{4c^4d} - \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d} - \frac{\left(a+b\sin^{-1}(\right.}{}$$

Mathematica [B] time = 0.124941, size = 294, normalized size = 2.04

$$-\frac{-4ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) - 4ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) + 2ac^2x^2 + 2a\log\left(1-c^2x^2\right) + bcx\sqrt{1-c^2x^2} + 2bc^2x^2\,\text{si}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -(2*a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2] - b*ArcSin[c*x] + (4*I)*b*Pi*ArcSin
[c*x] + 2*b*c^2*x^2*ArcSin[c*x] - (2*I)*b*ArcSin[c*x]^2 + 8*b*Pi*Log[1 + E^
((-I)*ArcSin[c*x])] + 2*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]
*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 4*b*A
rcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*a*Log[1 - c^2*x^2] - 8*b*Pi*Log
[Cos[ArcSin[c*x]/2]] + 2*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 2*b*Pi*Lo
g[Sin[(Pi + 2*ArcSin[c*x])/4]] - (4*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]
 - (4*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(4*c^4*d)
```

Maple [A] time = 0.148, size = 181, normalized size = 1.3

$$-\frac{ax^2}{2\,c^2d}-\frac{a\ln(cx-1)}{2\,c^4d}-\frac{a\ln(cx+1)}{2\,c^4d}+\frac{\frac{i}{2}b\,(\arcsin(cx))^2}{c^4d}-\frac{bx}{4\,c^3d}\sqrt{-c^2x^2+1}-\frac{b\arcsin(cx)\,x^2}{2\,c^2d}+\frac{b\arcsin(cx)}{4\,c^4d}-\frac{b\arcsi}{c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2/c^2*a/d*x^2-1/2/c^4*a/d*ln(c*x-1)-1/2/c^4*a/d*ln(c*x+1)+1/2*I/c^4*b/d*
arcsin(c*x)^2-1/4*b*x*(-c^2*x^2+1)^(1/2)/c^3/d-1/2/c^2*b/d*arcsin(c*x)*x^2+
1/4*b*arcsin(c*x)/c^4/d-1/c^4*b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2
))^2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{x^2}{c^2d}+\frac{\log\left(c^2x^2-1\right)}{c^4d}\right)-\frac{\left(c^4d\int\frac{c^2x^2e^{\left(\frac{1}{2}\log(cx+1)+\frac{1}{2}\log(-cx+1)\right)}+e^{\left(\frac{1}{2}\log(cx+1)+\frac{1}{2}\log(-cx+1)\right)}\log(cx+1)+e^{\left(\frac{1}{2}\log(cx+1)+\frac{1}{2}\log(-cx+1)\right)}\log(-cx+1}{c^7dx^4-c^5dx^2-\left(c^5dx^2-c^3d\right)(cx+1)(cx-1)}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(x^2/(c^2*d) + log(c^2*x^2 - 1)/(c^4*d)) - 1/2*(2*c^4*d*integrate(1/
2*(c^2*x^2*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1)) + e^(1/2*log(c*x + 1) +
 1/2*log(-c*x + 1))*log(c*x + 1) + e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))
*log(-c*x + 1))/(c^7*d*x^4 - c^5*d*x^2 + (c^5*d*x^2 - c^3*d)*e^(log(c*x + 1
) + log(-c*x + 1))), x) + c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^4*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{bx^3\arcsin(cx)+ax^3}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^3*arcsin(c*x) + a*x^3)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{ax^3}{c^2x^2-1}\,dx + \int \frac{bx^3 \operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**3/(c**2*x**2 - 1), x) + Integral(b*x**3*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)x^3}{c^2dx^2 - d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^3/(c^2*d*x^2 - d), x)
```

3.30 $\int \frac{x^2(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx$

Optimal. Leaf size=124

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^3d}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d}-\frac{2i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d}-$$

```
[Out] -((b*Sqrt[1 - c^2*x^2])/(c^3*d)) - (x*(a + b*ArcSin[c*x]))/(c^2*d) - ((2*I)
*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d) + (I*b*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^3*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^
3*d)
```

Rubi [A] time = 0.137464, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {4715, 4657, 4181, 2279, 2391, 261}

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^3d}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d}-\frac{2i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -((b*Sqrt[1 - c^2*x^2])/(c^3*d)) - (x*(a + b*ArcSin[c*x]))/(c^2*d) - ((2*I)
*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d) + (I*b*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^3*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^
3*d)
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx &= -\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d}+\frac{\int\frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{c^2}+\frac{b\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{cd}\\ &= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d}+\frac{\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{c^3d}\\ &= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d}-\frac{2i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d}-\frac{b\,\text{Subst}\left(\int\right.}{}\\ &= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d}-\frac{2i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d}+\frac{(ib)\,\text{Subst}}{}\\ &= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d}-\frac{2i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d}+\frac{ib\text{Li}_2\left(-ie^{i}\right.}{c^3d}\end{aligned}$$

Mathematica [A] time = 0.102074, size = 238, normalized size = 1.92

$$-\frac{-2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+2acx+a\log(1-cx)-a\log(cx+1)+2b\sqrt{1-c^2x^2}+}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -(2*a*c*x + 2*b*Sqrt[1 - c^2*x^2] + I*b*Pi*ArcSin[c*x] + 2*b*c*x*ArcSin[c*x
] - b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcS
in[c*x])] - b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 + I*E
^(I*ArcSin[c*x])] + a*Log[1 - c*x] - a*Log[1 + c*x] + b*Pi*Log[-Cos[(Pi + 2
*ArcSin[c*x])/4]] + b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(2*c
^3*d)
```

Maple [A] time = 0.096, size = 218, normalized size = 1.8

$$-\frac{ax}{c^2d}-\frac{a\ln(cx-1)}{2c^3d}+\frac{a\ln(cx+1)}{2c^3d}-\frac{b}{c^3d}\sqrt{-c^2x^2+1}+\frac{b\arcsin(cx)}{c^3d}\ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-\frac{b\arcsin(cx)}{c^3d}\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

```
[Out] -1/c^2*a/d*x-1/2/c^3*a/d*ln(c*x-1)+1/2/c^3*a/d*ln(c*x+1)-b*(-c^2*x^2+1)^(1/
2)/c^3/d+1/c^3*b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/c^3*b/d
*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/c^2*b/d*arcsin(c*x)*x-I/c
^3*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I/c^3*b/d*dilog(1+I*(I*c*x+(-c
^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{2\,x}{c^2d}-\frac{\log\left(cx+1\right)}{c^3d}+\frac{\log\left(cx-1\right)}{c^3d}\right)+\frac{-\left(c^3d\left(\frac{2\,\sqrt{cx+1}\sqrt{-cx+1}}{c^3d}+\int-\frac{\sqrt{cx+1}\sqrt{-cx+1}(\log(cx+1)-\log(-cx+1))}{c^4dx^2-c^2d}\,dx\right)+2\,cx\arctan\left(c\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*x/(c^2*d) - log(c*x + 1)/(c^3*d) + log(c*x - 1)/(c^3*d)) + 1/2*(2
*c^3*d*integrate(-1/2*(2*c*x - log(c*x + 1) + log(-c*x + 1))*sqrt(c*x + 1)*
sqrt(-c*x + 1)/(c^4*d*x^2 - c^2*d), x) - 2*c*x*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) -
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^3*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{bx^2\arcsin\left(cx\right)+ax^2}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^2*arcsin(c*x) + a*x^2)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{ax^2}{c^2x^2-1}\,dx+\int\frac{bx^2\operatorname{asin}\left(cx\right)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**2/(c**2*x**2 - 1), x) + Integral(b*x**2*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int-\frac{\left(b\arcsin\left(cx\right)+a\right)x^2}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d), x)
```

3.31 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx$

Optimal. Leaf size=82

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2c^2d}+\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^2d}-\frac{\log\left(1+e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^2d}$$

```
[Out] ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^2*d) - ((a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c^2*d) + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/
(c^2*d)
```

Rubi [A] time = 0.105294, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4675, 3719, 2190, 2279, 2391}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2c^2d}+\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^2d}-\frac{\log\left(1+e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^2*d) - ((a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c^2*d) + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/
(c^2*d)
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx = \frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(cx)\right)}{c^2d}$$
$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^2d} - \frac{(2i)\,\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \sin^{-1}(cx)\right)}{c^2d}$$
$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^2d} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{b\,\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx\right.}{c^2d}$$
$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^2d} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} - \frac{(ib)\,\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x,\right.}{2c^2d}$$
$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^2d} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{ib\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{2c^2d}$$

Mathematica [B] time = 0.0762788, size = 244, normalized size = 2.98

$$-\frac{-2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+a\log\left(1-c^2x^2\right)-ib\sin^{-1}(cx)^2+2i\pi b\sin^{-1}(cx)+2b\,\text{s}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -((2*I)*b*Pi*ArcSin[c*x] - I*b*ArcSin[c*x]^2 + 4*b*Pi*Log[1 + E^((-I)*ArcSi
n[c*x])] + b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 - I*E^
(I*ArcSin[c*x])] - b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[
1 + I*E^(I*ArcSin[c*x])] + a*Log[1 - c^2*x^2] - 4*b*Pi*Log[Cos[ArcSin[c*x]/
2]] + b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - b*Pi*Log[Sin[(Pi + 2*ArcSin[
c*x])/4]] - (2*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLog[2,
 I*E^(I*ArcSin[c*x])])/(2*c^2*d)
```

Maple [A] time = 0.042, size = 118, normalized size = 1.4

$$-\frac{a\ln(cx-1)}{2c^2d} - \frac{a\ln(cx+1)}{2c^2d} + \frac{\frac{i}{2}b\left(\arcsin(cx)\right)^2}{c^2d} - \frac{b\arcsin(cx)}{c^2d}\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right) + \frac{\frac{i}{2}b}{c^2d}\text{polylog}\left(2,-\left(ic\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2/c^2*a/d*ln(c*x-1)-1/2/c^2*a/d*ln(c*x+1)+1/2*I/c^2*b/d*arcsin(c*x)^2-1/
c^2*b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*I*b*polylog(2,-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^2/d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(c^2d\int \frac{e^{\left(\frac{1}{2}\log(cx+1)+\frac{1}{2}\log(-cx+1)\right)}\log(cx+1)+e^{\left(\frac{1}{2}\log(cx+1)+\frac{1}{2}\log(-cx+1)\right)}\log(-cx+1)}{c^5dx^4-c^3dx^2-\left(c^3dx^2-cd\right)(cx+1)(cx-1)}\,dx+\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\log(cx+1)+\mathrm{a}\right.}{2c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*(2*c^2*d*integrate(1/2*(e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))*log(c
*x + 1) + e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))*log(-c*x + 1))/(c^5*d*x^
4 - c^3*d*x^2 + (c^3*d*x^2 - c*d)*e^(log(c*x + 1) + log(-c*x + 1))), x) + a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^2*d) - 1/2*a*log(c^2*d*x^2 - d
)/(c^2*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{bx\arcsin(cx)+ax}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x*arcsin(c*x) + a*x)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{ax}{c^2x^2-1}\,dx+\int \frac{bx\,\mathrm{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x/(c**2*x**2 - 1), x) + Integral(b*x*asin(c*x)/(c**2*x**2 - 1)
, x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx)+a)x}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x/(c^2*d*x^2 - d), x)
```

3.32 $\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx$

Optimal. Leaf size=84

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{cd}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{cd}-\frac{2i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd}$$

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + (I*b*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*d)
```

Rubi [A] time = 0.0672187, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4657, 4181, 2279, 2391}

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{cd}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{cd}-\frac{2i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2),x]
```

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + (I*b*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*d)
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx = \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{cd}$$
$$= -\frac{2i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} - \frac{b\,\text{Subst}\left(\int \log\left(1-ie^{ix}\right)dx, x, \sin^{-1}(cx)\right)}{cd} + \frac{b\,\text{Subst}\left(\int\right.}{}$$
$$= -\frac{2i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} + \frac{(ib)\,\text{Subst}\left(\int \frac{\log(1-ix)}{x}dx, x, e^{i\sin^{-1}(cx)}\right)}{cd} - \frac{(ib)\,\text{Subst}\left(\int\right.}{}$$
$$= -\frac{2i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} + \frac{ib\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd} - \frac{ib\text{Li}_2\left(ie^{i\sin^{-1}(cx)}\right)}{cd}$$

Mathematica [B] time = 0.229741, size = 207, normalized size = 2.46

$$2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) - 2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) - a\log(1-cx) + a\log(cx+1) - i\pi b\sin^{-1}(cx) + 2b\sin^{-1}(cx)\,\text{l}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2),x]
```

```
[Out] ((-I)*b*Pi*ArcSin[c*x] + b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x
]*Log[1 - I*E^(I*ArcSin[c*x])] + b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 2*b*Ar
cSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - a*Log[1 - c*x] + a*Log[1 + c*x] -
b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/
4]] + (2*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLog[2, I*E^(
I*ArcSin[c*x])])/(2*c*d)
```

Maple [B] time = 0.102, size = 426, normalized size = 5.1

$$\frac{a\text{Artanh}\,(cx)}{dc} + \frac{b\text{Artanh}\,(cx)\arcsin(cx)}{dc} - \frac{ib}{dc}\text{dilog}\left(-i\frac{1}{\sqrt{-c^2x^2+1}} - icx\frac{1}{\sqrt{-c^2x^2+1}}\right) + \frac{ib\text{Artanh}\,(cx)}{dc}\ln\left((1-i)\cosh\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

```
[Out] 1/c*a/d*arctanh(c*x)+1/c*b/d*arctanh(c*x)*arcsin(c*x)-I/c*b/d*dilog(-I/(-c^
2*x^2+1)^(1/2)-I*c*x/(-c^2*x^2+1)^(1/2))+I/c*b/d*ln((1-I)*cosh(1/2*arctanh(
c*x))+(1+I)*sinh(1/2*arctanh(c*x)))*arctanh(c*x)-I/c*b/d*ln((1-I)*cosh(1/2*
arctanh(c*x))+(1+I)*sinh(1/2*arctanh(c*x)))*ln(-I/(-c^2*x^2+1)^(1/2)-I*c*x/
(-c^2*x^2+1)^(1/2))+I/c*b/d*dilog(I/(-c^2*x^2+1)^(1/2)+I*c*x/(-c^2*x^2+1)^(
1/2))-I/c*b/d*ln((1+I)*cosh(1/2*arctanh(c*x))+(1-I)*sinh(1/2*arctanh(c*x)))
*arctanh(c*x)+I/c*b/d*ln((1+I)*cosh(1/2*arctanh(c*x))+(1-I)*sinh(1/2*arctan
h(c*x)))*ln(I/(-c^2*x^2+1)^(1/2)+I*c*x/(-c^2*x^2+1)^(1/2))+1/2*I/c*b/d*arct
anh(c*x)*ln(I/(-c^2*x^2+1)^(1/2)+I*c*x/(-c^2*x^2+1)^(1/2))-1/2*I/c*b/d*arct
anh(c*x)*ln(-I/(-c^2*x^2+1)^(1/2)-I*c*x/(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{\log(cx+1)}{cd} - \frac{\log(cx-1)}{cd}\right) + \frac{\left(cd\int \frac{\sqrt{cx+1}\sqrt{-cx+1}(\log(cx+1)-\log(-cx+1))}{c^2dx^2-d}dx + \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)\log(cx+1)\right.}{2cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(log(c*x + 1)/(c*d) - log(c*x - 1)/(c*d)) + 1/2*(2*c*d*integrate(1/2*
sqrt(c*x + 1)*sqrt(-c*x + 1)*(log(c*x + 1) - log(-c*x + 1))/(c^2*d*x^2 - d)
, x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b \arcsin(cx) + a}{c^2dx^2 - d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a}{c^2x^2-1}\,dx + \int \frac{b\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**2 - 1), x) + Integral(b*asin(c*x)/(c**2*x**2 - 1), x)
)/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b \arcsin(cx) + a}{c^2dx^2 - d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

3.33 $\int \frac{a+b\sin^{-1}(cx)}{x(d-c^2dx^2)}\,dx$

Optimal. Leaf size=71

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}$$

```
[Out] (-2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])
])/d
```

Rubi [A] time = 0.110487, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4679, 4419, 4183, 2279, 2391}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (-2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])
])/d
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)}\,dx &= \frac{\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\ &= \frac{2\,\text{Subst}\left(\int (a+bx)\csc(2x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\ &= -\frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{b\,\text{Subst}\left(\int \log\left(1-e^{2ix}\right)dx,x,\sin^{-1}(cx)\right)}{d}+\frac{b\,\text{Sub}}{}\\ &= -\frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{(ib)\,\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx,x,e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{(ib)\,\text{Sub}}{}\\ &= -\frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{ib\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{ib\text{Li}_2\left(e^{2i\sin^{-1}(cx)}\right)}{2d}\end{aligned}$$

Mathematica [A] time = 0.0764924, size = 105, normalized size = 1.48

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)-ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-a\log\left(1-c^2x^2\right)+2a\log(x)+2b\sin^{-1}(cx)\log\left(1-e^{2i\sin^{-1}(c}\right.}{2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (2*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - 2*b*ArcSin[c*x]*Log[1 + E
^((2*I)*ArcSin[c*x])] + 2*a*Log[x] - a*Log[1 - c^2*x^2] + I*b*PolyLog[2, -E
^((2*I)*ArcSin[c*x])] - I*b*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Maple [B] time = 0.073, size = 215, normalized size = 3.

$$-\frac{a\ln(cx-1)}{2d}-\frac{a\ln(cx+1)}{2d}+\frac{a\ln(cx)}{d}+\frac{b\arcsin(cx)}{d}\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-\frac{ib}{d}\text{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2*a/d*ln(c*x-1)-1/2*a/d*ln(c*x+1)+a/d*ln(c*x)+b/d*arcsin(c*x)*ln(1+I*c*x
+(-c^2*x^2+1)^(1/2))-I*b/d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+b/d*arcsin(
c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*b/d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))-b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*I*b*polylog(2,-(I
*c*x+(-c^2*x^2+1)^(1/2))^2)/d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}a\left(\frac{\log(cx+1)}{d}+\frac{\log(cx-1)}{d}-\frac{2\log(x)}{d}\right)-b\int \frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{c^2dx^3-dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(c*x + 1)/d + log(c*x - 1)/d - 2*log(x)/d) - b*integrate(arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^3 - d*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b \arcsin\left(cx\right) + a}{c^2dx^3 - dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^3 - d*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a}{c^2x^3-x}\,dx + \int \frac{b \operatorname{asin}\left(cx\right)}{c^2x^3-x}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**3 - x), x) + Integral(b*asin(c*x)/(c**2*x**3 - x), x)
)/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b \arcsin\left(cx\right) + a}{\left(c^2dx^2 - d\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x), x)
```

3.34 $\int \frac{a+b\sin^{-1}(cx)}{x^2(d-c^2dx^2)}\,dx$

Optimal. Leaf size=116

$$\frac{ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{2ic\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}$$

```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*Arc
Sin[c*x])])/d - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (I*b*c*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/d - (I*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
```

Rubi [A] time = 0.151488, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4701, 4657, 4181, 2279, 2391, 266, 63, 208}

$$\frac{ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{2ic\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*Arc
Sin[c*x])])/d - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (I*b*c*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/d - (I*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)}\,dx = -\frac{a+b\sin^{-1}(cx)}{dx}+c^2\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx+\frac{(bc)\int \frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx}+\frac{c\,\text{Subst}\left(\int (a+bx)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{d}+\frac{(bc)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx}-\frac{2ic\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{b\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{cd}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx}-\frac{2ic\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{(ibc)\,\text{Subs}}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx}-\frac{2ic\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{ibc\text{Li}_2\left(-i\right.}{d}$$

Mathematica [B] time = 0.34398, size = 259, normalized size = 2.23

$$-\frac{-2ibcx\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+2ibcx\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+acx\log(1-cx)-acx\log(cx+1)+2a+2bcx\tanh^{-1}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -(2*a + 2*b*ArcSin[c*x] + I*b*c*Pi*x*ArcSin[c*x] + 2*b*c*x*ArcTanh[Sqrt[1 -
 c^2*x^2]] - b*c*Pi*x*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*c*x*ArcSin[c*x]*Lo
g[1 - I*E^(I*ArcSin[c*x])] - b*c*Pi*x*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*c*
```

```
x*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + a*c*x*Log[1 - c*x] - a*c*x*Log
[1 + c*x] + b*c*Pi*x*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + b*c*Pi*x*Log[Sin[(
Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*c*x*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
(2*I)*b*c*x*PolyLog[2, I*E^(I*ArcSin[c*x])])/(2*d*x)
```

Maple [A] time = 0.133, size = 236, normalized size = 2.

$$-\frac{ca\ln(cx-1)}{2d}+\frac{ca\ln(cx+1)}{2d}-\frac{a}{dx}-\frac{b\arcsin(cx)}{dx}-\frac{bc\arcsin(cx)}{d}\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)+\frac{bc\arcsin(cx)}{d}\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2*c*a/d*ln(c*x-1)+1/2*c*a/d*ln(c*x+1)-a/d/x-b/d*arcsin(c*x)/x-c*b/d*arcs
in(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+c*b/d*arcsin(c*x)*ln(1-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-c*b/d*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+c*b/d*ln(I*c*x+(-
c^2*x^2+1)^(1/2)-1)-I*c*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*c*b/d*d
ilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{c\log(cx+1)}{d}-\frac{c\log(cx-1)}{d}-\frac{2}{dx}\right)+\frac{\left(cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\log(cx+1)-cx\arctan\left(cx,\sqrt{cx+1}\sqrt{\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(c*log(c*x + 1)/d - c*log(c*x - 1)/d - 2/(d*x)) + 1/2*(c*x*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - c*x*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*d*x*integrate(1/2*(c^2*x*log(c*x + 1)
 - c^2*x*log(-c*x + 1) - 2*c)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^3 - d*x
), x) - 2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(d*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b\arcsin(cx)+a}{c^2dx^4-dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^4 - d*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a}{c^2x^4-x^2}\,dx+\int\frac{b\operatorname{asin}(cx)}{c^2x^4-x^2}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**4 - x**2), x) + Integral(b*asin(c*x)/(c**2*x**4 - x**
2), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b\arcsin(cx) + a}{(c^2dx^2 - d)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^2), x)
```

3.35 $\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)}\,dx$

Optimal. Leaf size=124

$$\frac{ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{2c^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{a+b\sin^{-}}{2dx^2}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) - (2*c^2*(
a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*c^2*PolyLog
[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*
x])])/d
```

Rubi [A] time = 0.186891, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {4701, 4679, 4419, 4183, 2279, 2391, 264}

$$\frac{ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{2c^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{a+b\sin^{-}}{2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) - (2*c^2*(
a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*c^2*PolyLog
[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*
x])])/d
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)}\,dx &= -\frac{a+b\sin^{-1}(cx)}{2dx^2}+c^2\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)}\,dx+\frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\sin^{-1}(cx)}{2dx^2}+\frac{c^2\,\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\sin^{-1}(cx)}{2dx^2}+\frac{\left(2c^2\right)\text{Subst}\left(\int (a+bx)\csc(2x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\sin^{-1}(cx)}{2dx^2}-\frac{2c^2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{\left(bc^2\right)\text{Subst}\left(\int \log\right.}{}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\sin^{-1}(cx)}{2dx^2}-\frac{2c^2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{\left(ibc^2\right)\text{Subst}\left(\int \frac{\log}{}\right.}{}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\sin^{-1}(cx)}{2dx^2}-\frac{2c^2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{ibc^2\text{Li}_2\left(-e^{2i\sin^{-1}(\right.}{2d}
\end{aligned}$$

Mathematica [A] time = 0.334409, size = 149, normalized size = 1.2

$$-\frac{bc^2\left(-i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{\sqrt{1-c^2x^2}}{cx}+\frac{\sin^{-1}(cx)}{c^2x^2}-2\sin^{-1}(cx)\log\left(1-e^{2i\sin^{-1}(cx)}\right)+2\,\text{s}\right.}{2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -(a/x^2 - 2*a*c^2*Log[x] + a*c^2*Log[1 - c^2*x^2] + b*c^2*(Sqrt[1 - c^2*x^2
]/(c*x) + ArcSin[c*x]/(c^2*x^2) - 2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x
])] + 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - I*PolyLog[2, -E^((2*I)
*ArcSin[c*x])] + I*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(2*d)
```

Maple [B] time = 0.171, size = 296, normalized size = 2.4

$$-\frac{c^{2}a\ln\left(cx-1\right)}{2\,d}-\frac{c^{2}a\ln\left(cx+1\right)}{2\,d}-\frac{a}{2\,d x^{2}}+\frac{c^{2}a\ln\left(cx\right)}{d}+\frac{\frac{i}{2}c^{2}b}{d}-\frac{bc}{2\,dx}\sqrt{-c^{2}x^{2}+1}-\frac{b\arcsin\left(cx\right)}{2\,d x^{2}}+\frac{c^{2}b\arcsin\left(cx\right)}{d}\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2*c^2*a/d*ln(c*x-1)-1/2*c^2*a/d*ln(c*x+1)-1/2*a/d/x^2+c^2*a/d*ln(c*x)+1/
2*I*c^2*b/d-1/2*b*c*(-c^2*x^2+1)^(1/2)/d/x-1/2*b/d*arcsin(c*x)/x^2+c^2*b/d*
arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*c^2*b/d*polylog(2,-I*c*x-(-c^2
*x^2+1)^(1/2))+c^2*b/d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*c^2*b/d
*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-c^2*b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*
x^2+1)^(1/2))^2)+1/2*I*b*c^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\left(\frac{c^{2}\log\left(cx+1\right)}{d}+\frac{c^{2}\log\left(cx-1\right)}{d}-\frac{2\,c^{2}\log\left(x\right)}{d}+\frac{1}{dx^{2}}\right)a-b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{c^{2}dx^{5}-dx^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*(c^2*log(c*x + 1)/d + c^2*log(c*x - 1)/d - 2*c^2*log(x)/d + 1/(d*x^2))
*a - b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^5 - d*
x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b\arcsin\left(cx\right)+a}{c^{2}dx^{5}-dx^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a}{c^{2}x^{5}-x^{3}}\,dx+\int\frac{b\operatorname{asin}\left(cx\right)}{c^{2}x^{5}-x^{3}}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**5 - x**3), x) + Integral(b*asin(c*x)/(c**2*x**5 - x**
3), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b \arcsin (cx) + a}{\left(c^2dx^2 - d\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^3), x)
```

3.36 $\int \frac{a+b\sin^{-1}(cx)}{x^4(d-c^2dx^2)}\,dx$

Optimal. Leaf size=173

$$\frac{ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{c^2\left(a+b\sin^{-1}(cx)\right)}{dx}-\frac{2ic^3\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin\right.}{d}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(6*d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) - (c^2*(
a + b*ArcSin[c*x]))/(d*x) - ((2*I)*c^3*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcS
in[c*x])])/d - (7*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (I*b*c^3*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])])/d - (I*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])
/d
```

Rubi [A] time = 0.243657, antiderivative size = 173, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {4701, 4657, 4181, 2279, 2391, 266, 63, 208, 51}

$$\frac{ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{d}-\frac{c^2\left(a+b\sin^{-1}(cx)\right)}{dx}-\frac{2ic^3\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(6*d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) - (c^2*(
a + b*ArcSin[c*x]))/(d*x) - ((2*I)*c^3*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcS
in[c*x])])/d - (7*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (I*b*c^3*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])])/d - (I*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])
/d
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)}dx = -\frac{a+b\sin^{-1}(cx)}{3dx^3} + c^2\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)}dx + \frac{(bc)\int \frac{1}{x^3\sqrt{1-c^2x^2}}dx}{3d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{dx} + c^4\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}dx + \frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{x^2\sqrt{1-c^2x}}dx\right.}{6d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{dx} + \frac{c^3\,\mathrm{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{2ic^3\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(c\ldots}\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{2ic^3\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(c\ldots}\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{2ic^3\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(c\ldots}\right.}{d}$$

Mathematica [B] time = 0.147467, size = 350, normalized size = 2.02

$$-\frac{-6ibc^3x^3\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) + 6ibc^3x^3\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) + 6ac^2x^2 + 3ac^3x^3\log(1-cx) - 3ac^3x^3\log(cx\ldots}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -(2*a + 6*a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2] + 2*b*ArcSin[c*x] + 6*b*c^2*x
^2*ArcSin[c*x] + (3*I)*b*c^3*Pi*x^3*ArcSin[c*x] + 7*b*c^3*x^3*ArcTanh[Sqrt[
1 - c^2*x^2]] - 3*b*c^3*Pi*x^3*Log[1 - I*E^(I*ArcSin[c*x])] - 6*b*c^3*x^3*A
rcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*b*c^3*Pi*x^3*Log[1 + I*E^(I*Arc
Sin[c*x])] + 6*b*c^3*x^3*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a*c^3
*x^3*Log[1 - c*x] - 3*a*c^3*x^3*Log[1 + c*x] + 3*b*c^3*Pi*x^3*Log[-Cos[(Pi
+ 2*ArcSin[c*x])/4]] + 3*b*c^3*Pi*x^3*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6
*I)*b*c^3*x^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*c^3*x^3*PolyLog[
2, I*E^(I*ArcSin[c*x])])/(6*d*x^3)
```

Maple [A] time = 0.177, size = 303, normalized size = 1.8

$$-\frac{c^3a\ln(cx-1)}{2d} + \frac{c^3a\ln(cx+1)}{2d} - \frac{a}{3dx^3} - \frac{c^2a}{dx} - \frac{c^2b\arcsin(cx)}{dx} - \frac{bc}{6dx^2}\sqrt{-c^2x^2+1} - \frac{b\arcsin(cx)}{3dx^3} + \frac{7bc^3}{6d}\ln\left(icx\ldots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2*c^3*a/d*ln(c*x-1)+1/2*c^3*a/d*ln(c*x+1)-1/3*a/d/x^3-c^2*a/d/x-c^2*b/d*
arcsin(c*x)/x-1/6*b*c*(-c^2*x^2+1)^(1/2)/d/x^2-1/3*b/d*arcsin(c*x)/x^3+7/6*
c^3*b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-7/6*c^3*b/d*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))+c^3*b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-c^3*b/d*arcsi
n(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*c^3*b/d*dilog(1-I*(I*c*x+(-c^2*
x^2+1)^(1/2)))+I*c^3*b/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{6}\left(\frac{3\,c^3\log\left(cx+1\right)}{d}-\frac{3\,c^3\log\left(cx-1\right)}{d}-\frac{2\left(3\,c^2x^2+1\right)}{dx^3}\right)a+\frac{\left(3\,c^3x^3\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\log\left(cx+1\right)-3\,c^3x^3\,\mathrm{ar}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/6*(3*c^3*log(c*x + 1)/d - 3*c^3*log(c*x - 1)/d - 2*(3*c^2*x^2 + 1)/(d*x^3
))*a + 1/6*(3*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
1) - 3*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 6
*d*x^3*integrate(1/6*(3*c^4*x^3*log(c*x + 1) - 3*c^4*x^3*log(-c*x + 1) - 6*
c^3*x^2 - 2*c)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^5 - d*x^3), x) - 2*(3*
c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(d*x^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{b\arcsin\left(cx\right)+a}{c^2dx^6-dx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^6 - d*x^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a}{c^2x^6-x^4}\,dx+\int\frac{b\,\mathrm{asin}\,(cx)}{c^2x^6-x^4}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**6 - x**4), x) + Integral(b*asin(c*x)/(c**2*x**6 - x**
4), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int-\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^4), x)
```

3.37 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=187

$$-\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2c^5d^2}+\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2c^5d^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)}+\frac{3x\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2}+\frac{3i\tan^{-1}}{}$$

```
[Out] -b/(2*c^5*d^2*Sqrt[1 - c^2*x^2]) + (b*Sqrt[1 - c^2*x^2])/(c^5*d^2) + (3*x*(
a + b*ArcSin[c*x]))/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 -
 c^2*x^2)) + ((3*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^2
) - (((3*I)/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^2) + (((3*I)/2)
*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```

Rubi [A] time = 0.236777, antiderivative size = 187, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {4703, 4715, 4657, 4181, 2279, 2391, 261, 266, 43}

$$-\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2c^5d^2}+\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2c^5d^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)}+\frac{3x\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2}+\frac{3i\tan^{-1}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -b/(2*c^5*d^2*Sqrt[1 - c^2*x^2]) + (b*Sqrt[1 - c^2*x^2])/(c^5*d^2) + (3*x*(
a + b*ArcSin[c*x]))/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 -
 c^2*x^2)) + ((3*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^2
) - (((3*I)/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^2) + (((3*I)/2)
*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{x^3}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^2} - \frac{3\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= \frac{3x\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{(3b)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{2c^3d^2} - \frac{b\,\mathrm{Subst}\left(\int \frac{x}{\left(1-c^2x\right)^{3/2}}\,dx\right.}{4cd^2}$$

$$= \frac{3b\sqrt{1-c^2x^2}}{2c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{3\,\mathrm{Subst}\left(\int (a+bx)\sec(x)\,d\right.}{2c^5d^2}$$

$$= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} + \frac{3i\left(a+b\right.}{}$$

$$= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} + \frac{3i\left(a+b\right.}{}$$

$$= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} + \frac{3i\left(a+b\right.}{}$$

Mathematica [A] time = 0.452945, size = 332, normalized size = 1.78

$$-6ib\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+6ib\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)-\frac{2acx}{c^2x^2-1}+4acx+3a\log(1-cx)-3a\log(cx+1)+\frac{b\sqrt{1-c^2}}{cx-1}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (4*a*c*x + 4*b*Sqrt[1 - c^2*x^2] + (b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (b*Sq
rt[1 - c^2*x^2])/(1 + c*x) - (2*a*c*x)/(-1 + c^2*x^2) + (3*I)*b*Pi*ArcSin[c
*x] + 4*b*c*x*ArcSin[c*x] + (b*ArcSin[c*x])/(1 - c*x) - (b*ArcSin[c*x])/(1
+ c*x) - 3*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 6*b*ArcSin[c*x]*Log[1 - I*E^
(I*ArcSin[c*x])] - 3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b*ArcSin[c*x]*Lo
g[1 + I*E^(I*ArcSin[c*x])] + 3*a*Log[1 - c*x] - 3*a*Log[1 + c*x] + 3*b*Pi*L
og[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
- (6*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(4*c^5*d^2)
```

Maple [A] time = 0.267, size = 305, normalized size = 1.6

$$\frac{ax}{c^4d^2}-\frac{a}{4\,c^5d^2\,(cx-1)}+\frac{3\,a\ln(cx-1)}{4\,c^5d^2}-\frac{a}{4\,c^5d^2\,(cx+1)}-\frac{3\,a\ln(cx+1)}{4\,c^5d^2}+\frac{b}{c^5d^2}\sqrt{-c^2x^2+1}+\frac{b\arcsin(cx)\,x}{c^4d^2}-\frac{b\,\mathrm{ar}}{2\,c^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

```
[Out] 1/c^4*a/d^2*x-1/4/c^5*a/d^2/(c*x-1)+3/4/c^5*a/d^2*ln(c*x-1)-1/4/c^5*a/d^2/(
c*x+1)-3/4/c^5*a/d^2*ln(c*x+1)+b*(-c^2*x^2+1)^(1/2)/c^5/d^2+1/c^4*b/d^2*arc
```

```
sin(c*x)*x-1/2/c^4*b/d^2/(c^2*x^2-1)*arcsin(c*x)*x+1/2/c^5*b/d^2/(c^2*x^2-1
)*(-c^2*x^2+1)^(1/2)+3/2/c^5*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(
1/2)))-3/2/c^5*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*I/c
^5*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*I/c^5*b/d^2*dilog(1-I*(I
*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a\left(\frac{2x}{c^6d^2x^2-c^4d^2}-\frac{4x}{c^4d^2}+\frac{3\log(cx+1)}{c^5d^2}-\frac{3\log(cx-1)}{c^5d^2}\right)-\frac{\left(3\left(c^2x^2-1\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\log(cx+1)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^6*d^2*x^2 - c^4*d^2) - 4*x/(c^4*d^2) + 3*log(c*x + 1)/(c^5*d
^2) - 3*log(c*x - 1)/(c^5*d^2)) - 1/4*(3*(c^2*x^2 - 1)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^2*x^2 - 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(2*c^3*x^3 - 3*c*x)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) + 4*(c^7*d^2*x^2 - c^5*d^2)*integrate(-1/4*(4*c
^3*x^3 - 6*c*x - 3*(c^2*x^2 - 1)*log(c*x + 1) + 3*(c^2*x^2 - 1)*log(-c*x +
1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^8*d^2*x^4 - 2*c^6*d^2*x^2 + c^4*d^2), x
))*b/(c^7*d^2*x^2 - c^5*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^4\arcsin(cx)+ax^4}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{ax^4}{c^4x^4-2c^2x^2+1}\,dx+\int\frac{bx^4\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**4/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**4*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^4}{(c^2dx^2 - d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d)^2, x)
```

3.38 $\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=155

$$-\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d^2}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d^2}+\frac{\log\left(1+e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d^2}-\frac{\ldots}{2c^3\ldots}$$

```
[Out] -(b*x)/(2*c^3*d^2*Sqrt[1 - c^2*x^2]) + (b*ArcSin[c*x])/(2*c^4*d^2) + (x^2*(
a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 - c^2*x^2)) - ((I/2)*(a + b*ArcSin[c*x])^
2)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^4*
d^2) - ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2)
```

Rubi [A] time = 0.183785, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4703, 4675, 3719, 2190, 2279, 2391, 288, 216}

$$-\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d^2}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d^2}+\frac{\log\left(1+e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d^2}-\frac{\ldots}{2c^3\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -(b*x)/(2*c^3*d^2*Sqrt[1 - c^2*x^2]) + (b*ArcSin[c*x])/(2*c^4*d^2) + (x^2*(
a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 - c^2*x^2)) - ((I/2)*(a + b*ArcSin[c*x])^
2)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^4*
d^2) - ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2)
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^2} - \frac{\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx}{c^2d}$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(cx)\right)}{c^4d^2} + \frac{b}{\cdots}$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d^2} + \frac{(2i)\,\text{Subs}\cdots}{\cdots}$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d^2} + \frac{\left(a+b\sin\cdots\right.}{\cdots}$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d^2} + \frac{\left(a+b\sin\cdots\right.}{\cdots}$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bc^4d^2} + \frac{\left(a+b\sin\cdots\right.}{\cdots}$$

Mathematica [B] time = 0.520148, size = 334, normalized size = 2.15

$$-4ib\,\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) - 4ib\,\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) - \frac{2a}{c^2x^2-1} + 2a\log\left(1-c^2x^2\right) + \frac{b\sqrt{1-c^2x^2}}{cx-1} + \frac{b\sqrt{1-c^2x^2}}{cx+1} - 2ib\sin\cdots$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((b*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2*a)
/(-1 + c^2*x^2) + (4*I)*b*Pi*ArcSin[c*x] + (b*ArcSin[c*x])/(1 - c*x) + (b*A
rcSin[c*x])/(1 + c*x) - (2*I)*b*ArcSin[c*x]^2 + 8*b*Pi*Log[1 + E^((-I)*ArcS
in[c*x])] + 2*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]*Log[1 - I
*E^(I*ArcSin[c*x])] - 2*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]
*Log[1 + I*E^(I*ArcSin[c*x])] + 2*a*Log[1 - c^2*x^2] - 8*b*Pi*Log[Cos[ArcSi
n[c*x]/2]] + 2*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 2*b*Pi*Log[Sin[(Pi
+ 2*ArcSin[c*x])/4]] - (4*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*b
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(4*c^4*d^2)
```

Maple [A] time = 0.263, size = 251, normalized size = 1.6

$$-\frac{a}{4\,c^4d^2\,(cx-1)}+\frac{a\ln(cx-1)}{2\,c^4d^2}+\frac{a}{4\,c^4d^2\,(cx+1)}+\frac{a\ln(cx+1)}{2\,c^4d^2}-\frac{\frac{i}{2}b\,(\arcsin(cx))^2}{c^4d^2}-\frac{\frac{i}{2}bx^2}{c^2d^2\left(c^2x^2-1\right)}+\frac{bx}{2\,c^3d^2\left(c^2x^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4/c^4*a/d^2/(c*x-1)+1/2/c^4*a/d^2*ln(c*x-1)+1/4/c^4*a/d^2/(c*x+1)+1/2/c^
4*a/d^2*ln(c*x+1)-1/2*I/c^4*b/d^2*arcsin(c*x)^2-1/2*I/c^2*b/d^2/(c^2*x^2-1)
*x^2+1/2/c^3*b/d^2/(c^2*x^2-1)*x*(-c^2*x^2+1)^(1/2)-1/2/c^4*b/d^2/(c^2*x^2-
1)*arcsin(c*x)+1/2*I/c^4*b/d^2/(c^2*x^2-1)+1/c^4*b/d^2*arcsin(c*x)*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
/c^4/d^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{1}{c^6d^2x^2-c^4d^2}-\frac{\log\left(c^2x^2-1\right)}{c^4d^2}\right)+\frac{\left(\left(c^2x^2-1\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\log(cx+1)+\left(c^2x^2-1\right)\arctan\left(cx,\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(1/(c^6*d^2*x^2 - c^4*d^2) - log(c^2*x^2 - 1)/(c^4*d^2)) + 1/2*((c^2
*x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + (c^2*x^
2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*(c^6*d^
2*x^2 - c^4*d^2)*integrate(1/2*((c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1/2*log
(-c*x + 1))*log(c*x + 1) + (c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x
 + 1))*log(-c*x + 1) - e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1)))/(c^9*d^2*x
^6 - 2*c^7*d^2*x^4 + c^5*d^2*x^2 + (c^7*d^2*x^4 - 2*c^5*d^2*x^2 + c^3*d^2)*
e^(log(c*x + 1) + log(-c*x + 1))), x) - arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))*b/(c^6*d^2*x^2 - c^4*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^3 \arcsin(cx) + ax^3}{c^4d^2x^4 - 2\,c^2d^2x^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{ax^3}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^3 \operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**3/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**3*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^3}{\left(c^2dx^2 - d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(c^2*d*x^2 - d)^2, x)
```

3.39 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=144

$$-\frac{ib\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2c^3d^2}+\frac{ib\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2c^3d^2}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)}+\frac{i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d^2}-$$

```
[Out] -b/(2*c^3*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 -
c^2*x^2)) + (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d^2) - (
(I/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + ((I/2)*b*PolyLog[2,
 I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```

Rubi [A] time = 0.136193, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {4703, 4657, 4181, 2279, 2391, 261}

$$-\frac{ib\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2c^3d^2}+\frac{ib\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2c^3d^2}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)}+\frac{i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -b/(2*c^3*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 -
c^2*x^2)) + (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d^2) - (
(I/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + ((I/2)*b*PolyLog[2,
 I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^2} - \frac{\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} - \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{2c^3d^2}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2} + \frac{b\,\text{Subst}}{}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2} - \frac{(ib)\,\text{Sub}}{}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2} - \frac{ib\,\text{Li}_2\left(-\right.}{2}$$

Mathematica [B] time = 0.173277, size = 463, normalized size = 3.22

$$b\left(\frac{-\frac{2i\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c} - \frac{i\sin^{-1}(cx)^2}{2c} + \frac{3i\pi\sin^{-1}(cx)}{2c} + \frac{2\sin^{-1}(cx)\log\left(1+ie^{i\sin^{-1}(cx)}\right)}{c} + \frac{2\pi\log\left(1+e^{-i\sin^{-1}(cx)}\right)}{c} - \frac{\pi\log\left(1+ie^{i\sin^{-1}(cx)}\right)}{c} - \frac{2\pi\log\left(\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\right.}{c}}{4c^2}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -(a*x)/(2*c^2*d^2*(-1 + c^2*x^2)) + (a*Log[1 - c*x])/(4*c^3*d^2) - (a*Log[1
 + c*x])/(4*c^3*d^2) + (b*((Sqrt[1 - c^2*x^2] - ArcSin[c*x])/(4*c^3*(-1 + c
*x)) - (Sqrt[1 - c^2*x^2] + ArcSin[c*x])/(4*c^2*(c + c^2*x)) + ((((3*I)/2)*
Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[
c*x])])/c - (Pi*Log[1 + I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*
E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c)/(4
*c^2) - (((I/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 +
 E^((-I)*ArcSin[c*x])])/c + (Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin
```

```
[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c -
(Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c
*x])])/c)/(4*c^2)))/d^2
```

Maple [A] time = 0.171, size = 263, normalized size = 1.8

$$-\frac{a}{4\,c^3d^2\,(cx-1)}+\frac{a\ln(cx-1)}{4\,c^3d^2}-\frac{a}{4\,c^3d^2\,(cx+1)}-\frac{a\ln(cx+1)}{4\,c^3d^2}-\frac{b\arcsin(cx)\,x}{2\,c^2d^2\left(c^2x^2-1\right)}+\frac{b}{2\,c^3d^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}+\frac{b\,\mathrm{ar}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4/c^3*a/d^2/(c*x-1)+1/4/c^3*a/d^2*ln(c*x-1)-1/4/c^3*a/d^2/(c*x+1)-1/4/c^
3*a/d^2*ln(c*x+1)-1/2/c^2*b/d^2/(c^2*x^2-1)*arcsin(c*x)*x+1/2/c^3*b/d^2/(c^
2*x^2-1)*(-c^2*x^2+1)^(1/2)+1/2/c^3*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x
^2+1)^(1/2)))-1/2/c^3*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-
1/2*I/c^3*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*I/c^3*b/d^2*dilog
(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}\,a\left(\frac{2\,x}{c^4d^2x^2-c^2d^2}+\frac{\log(cx+1)}{c^3d^2}-\frac{\log(cx-1)}{c^3d^2}\right)-\frac{\left(2\,cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+\left(c^2x^2-1\right)\arctan\left(cx,\sqrt{cx+}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^4*d^2*x^2 - c^2*d^2) + log(c*x + 1)/(c^3*d^2) - log(c*x - 1)
/(c^3*d^2)) - 1/4*(2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (c^2*
x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (c^2*x^2
 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 4*(c^5*d^2
*x^2 - c^3*d^2)*integrate(1/4*(2*c*x + (c^2*x^2 - 1)*log(c*x + 1) - (c^2*x^
2 - 1)*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^2*x^4 - 2*c^4*d^2
*x^2 + c^2*d^2), x))*b/(c^5*d^2*x^2 - c^3*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^2\arcsin(cx)+ax^2}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{ax^2}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^2\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**2*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)x^2}{(c^2dx^2 - d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d)^2, x)
```

3.40 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=57

$$\frac{a+b\sin^{-1}(cx)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{bx}{2cd^2\sqrt{1-c^2x^2}}$$

```
[Out] -(b*x)/(2*c*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*c^2*d^2*(1 - c^
2*x^2))
```

Rubi [A] time = 0.047586, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {4677, 191}

$$\frac{a+b\sin^{-1}(cx)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{bx}{2cd^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -(b*x)/(2*c*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*c^2*d^2*(1 - c^
2*x^2))
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx&=\frac{a+b\sin^{-1}(cx)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{b\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^2}\\&=-\frac{bx}{2cd^2\sqrt{1-c^2x^2}}+\frac{a+b\sin^{-1}(cx)}{2c^2d^2\left(1-c^2x^2\right)}\end{aligned}$$

Mathematica [A] time = 0.047155, size = 50, normalized size = 0.88

$$\frac{a-bcx\sqrt{1-c^2x^2}+b\sin^{-1}(cx)}{2c^2d^2-2c^4d^2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (a - b*c*x*Sqrt[1 - c^2*x^2] + b*ArcSin[c*x])/(2*c^2*d^2 - 2*c^4*d^2*x^2)
```

Maple [A] time = 0.011, size = 98, normalized size = 1.7

$$\frac{1}{c^2}\left(-\frac{a}{2\,d^2\left(c^2x^2-1\right)}+\frac{b}{d^2}\left(-\frac{\arcsin(cx)}{2\,c^2x^2-2}+\frac{1}{4\,cx-4}\sqrt{-(cx-1)^2-2\,cx+2}+\frac{1}{4\,cx+4}\sqrt{-(cx+1)^2+2\,cx+2}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

```
[Out] 1/c^2*(-1/2*a/d^2/(c^2*x^2-1)+b/d^2*(-1/2/(c^2*x^2-1)*arcsin(c*x)+1/4/(c*x-
1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/4/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)))
```

Maxima [B] time = 1.74219, size = 225, normalized size = 3.95

$$\frac{1}{4}\left(\frac{\left(\frac{\sqrt{-c^2x^2+1}c^2d^2}{c^6d^4+\sqrt{c^6d^4}c^4d^2x}-\frac{\sqrt{-c^2x^2+1}c^2d^2}{c^6d^4-\sqrt{c^6d^4}c^4d^2x}\right)c^5d^2}{\sqrt{c^6d^4}}-\frac{2\arcsin(cx)}{c^4d^2x^2-c^2d^2}\right)b-\frac{a}{2\left(c^4d^2x^2-c^2d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/4*((sqrt(-c^2*x^2 + 1)*c^2*d^2/(c^6*d^4 + sqrt(c^6*d^4)*c^4*d^2*x) - sqrt
(-c^2*x^2 + 1)*c^2*d^2/(c^6*d^4 - sqrt(c^6*d^4)*c^4*d^2*x))*c^5*d^2/sqrt(c^
6*d^4) - 2*arcsin(c*x)/(c^4*d^2*x^2 - c^2*d^2))*b - 1/2*a/(c^4*d^2*x^2 - c^
2*d^2)
```

Fricas [A] time = 2.04174, size = 115, normalized size = 2.02

$$-\frac{ac^2x^2-\sqrt{-c^2x^2+1}bcx+b\arcsin(cx)}{2\left(c^4d^2x^2-c^2d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(a*c^2*x^2 - sqrt(-c^2*x^2 + 1)*b*c*x + b*arcsin(c*x))/(c^4*d^2*x^2 -
c^2*d^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{ax}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{bx\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x*asin(c*x)/(c
**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [A] time = 1.40863, size = 120, normalized size = 2.11

$$-\frac{bx^2\arcsin(cx)}{2\left(c^2x^2-1\right)d^2}-\frac{ax^2}{2\left(c^2x^2-1\right)d^2}-\frac{bx}{2\sqrt{-c^2x^2+1}cd^2}+\frac{b\arcsin(cx)}{2c^2d^2}+\frac{a}{2c^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*b*x^2*arcsin(c*x)/((c^2*x^2 - 1)*d^2) - 1/2*a*x^2/((c^2*x^2 - 1)*d^2)
- 1/2*b*x/(sqrt(-c^2*x^2 + 1)*c*d^2) + 1/2*b*arcsin(c*x)/(c^2*d^2) + 1/2*a/
(c^2*d^2)
```

3.41 $\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=141

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2cd^2}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2cd^2}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd^2}$$

```
[Out] -b/(2*c*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^
2)) - (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d^2) + ((I/2)*b*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - ((I/2)*b*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c*d^2)
```

Rubi [A] time = 0.0956248, antiderivative size = 141, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4655, 4657, 4181, 2279, 2391, 261}

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2cd^2}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2cd^2}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^2,x]
```

```
[Out] -b/(2*c*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^
2)) - (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d^2) + ((I/2)*b*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - ((I/2)*b*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c*d^2)
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^2} + \frac{\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} + \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{2cd^2}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2} - \frac{b\,\text{Subst}\left(\int \log\left(1\right.\right.}{}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2} + \frac{(ib)\,\text{Subst}\left(\int \frac{\log}{}\right.}{}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2} + \frac{ib\text{Li}_2\left(-ie^{i\sin^{-1}(c}\right.}{2cd^2}$$

Mathematica [B] time = 0.807709, size = 334, normalized size = 2.37

$$-\frac{-\frac{2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c}+\frac{2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c}+\frac{2ax}{c^2x^2-1}+\frac{a\log(1-cx)}{c}-\frac{a\log(cx+1)}{c}+\frac{b\sqrt{1-c^2x^2}}{c-c^2x}+\frac{b\sqrt{1-c^2x^2}}{c^2x+c}+\frac{b\sin^{-1}(cx)}{c^2x+c}+\frac{b\sin}{c(c}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*Sqrt[1 - c^2*x^2])/(c - c^2*x) + (b*Sqrt[1 - c^2*x^2])/(c + c^2*x) + (
2*a*x)/(-1 + c^2*x^2) + (I*b*Pi*ArcSin[c*x])/c + (b*ArcSin[c*x])/(c*(-1 + c
*x)) + (b*ArcSin[c*x])/(c + c^2*x) - (b*Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c
- (2*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (b*Pi*Log[1 + I*E^(I*A
rcSin[c*x])])/c + (2*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c + (a*Log
[1 - c*x])/c - (a*Log[1 + c*x])/c + (b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
)/c + (b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*b*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])])/c + ((2*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/c)/(4*d^2
)
```

Maple [A] time = 0.087, size = 260, normalized size = 1.8

$$-\frac{a}{4\,cd^2\,(cx-1)}-\frac{a\ln(cx-1)}{4\,cd^2}-\frac{a}{4\,cd^2\,(cx+1)}+\frac{a\ln(cx+1)}{4\,cd^2}-\frac{b\arcsin(cx)\,x}{2\,d^2\left(c^2x^2-1\right)}+\frac{b}{2\,cd^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}-\frac{b\arcs}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4/c*a/d^2/(c*x-1)-1/4/c*a/d^2*ln(c*x-1)-1/4/c*a/d^2/(c*x+1)+1/4/c*a/d^2*
ln(c*x+1)-1/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)*x+1/2/c*b/d^2/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)-1/2/c*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/
2/c*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*I/c*b/d^2*dilo
g(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*I/c*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+
1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}\,a\left(\frac{2\,x}{c^2d^2x^2-d^2}-\frac{\log(cx+1)}{cd^2}+\frac{\log(cx-1)}{cd^2}\right)-\frac{\left(2\,cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)-\left(c^2x^2-1\right)\arctan\left(cx,\sqrt{cx}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^2*d^2*x^2 - d^2) - log(c*x + 1)/(c*d^2) + log(c*x - 1)/(c*d^
2)) - 1/4*(2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (c^2*x^2 - 1)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + (c^2*x^2 - 1)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 4*(c^3*d^2*x^2 - c
*d^2)*integrate(-1/4*(2*c*x - (c^2*x^2 - 1)*log(c*x + 1) + (c^2*x^2 - 1)*lo
g(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^
2), x))*b/(c^3*d^2*x^2 - c*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\arcsin(cx)+a}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin(cx) + a}{\left(c^2dx^2 - d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(c^2*d*x^2 - d)^2, x)
```

3.42 $\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=122

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d^2}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)}-\frac{2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}\cdot$$

```
[Out] -(b*c*x)/(2*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*d^2*(1 - c^2*x^
2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + ((I/2)*b
*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((I/2)*b*PolyLog[2, E^((2*I)*Arc
Sin[c*x])])/d^2
```

Rubi [A] time = 0.172984, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {4705, 4679, 4419, 4183, 2279, 2391, 191}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d^2}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)}-\frac{2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}\cdot$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] -(b*c*x)/(2*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*d^2*(1 - c^2*x^
2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + ((I/2)*b
*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((I/2)*b*PolyLog[2, E^((2*I)*Arc
Sin[c*x])])/d^2
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^2}\,dx = \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^2} + \frac{\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)}\,dx}{d}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} + \frac{\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} + \frac{2\,\text{Subst}\left(\int (a+bx)\csc(2x)\,dx, x, \sin^{-1}(cx)\right)}{d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{b\,\text{Subst}\left(\int \log\left(1 -\right.\right.}{}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} + \frac{(ib)\,\text{Subst}\left(\int \frac{\log(1}{x}\right.}{2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} + \frac{ib\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right.}{2d^2}$$

Mathematica [A] time = 0.356829, size = 153, normalized size = 1.25

$$\frac{b\left(i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)-i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{cx}{\sqrt{1-c^2x^2}}+\frac{\sin^{-1}(cx)}{1-c^2x^2}+2\sin^{-1}(cx)\log\left(1-e^{2i\sin^{-1}(cx)}\right)-2\sin^{-1}(\right.}{2d^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] (a/(1 - c^2*x^2) + 2*a*Log[x] - a*Log[1 - c^2*x^2] + b*(-((c*x)/Sqrt[1 - c^
2*x^2]) + ArcSin[c*x]/(1 - c^2*x^2) + 2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin
[c*x])] - 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] + I*PolyLog[2, -E^((
```

```
2*I)*ArcSin[c*x])] - I*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(2*d^2)
```

Maple [B] time = 0.169, size = 335, normalized size = 2.8

$$-\frac{a}{4\,d^2\,(cx-1)}-\frac{a\ln(cx-1)}{2\,d^2}+\frac{a}{4\,d^2\,(cx+1)}-\frac{a\ln(cx+1)}{2\,d^2}+\frac{a\ln(cx)}{d^2}-\frac{\frac{i}{2}bc^2x^2}{d^2\left(c^2x^2-1\right)}+\frac{xbc}{2\,d^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4*a/d^2/(c*x-1)-1/2*a/d^2*ln(c*x-1)+1/4*a/d^2/(c*x+1)-1/2*a/d^2*ln(c*x+1
)+a/d^2*ln(c*x)-1/2*I*b/d^2/(c^2*x^2-1)*c^2*x^2+1/2*b/d^2/(c^2*x^2-1)*c*x*(
-c^2*x^2+1)^(1/2)-1/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)+1/2*I*b/d^2/(c^2*x^2-1)
+b/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b/d^2*polylog(2,-I*c*x-
(-c^2*x^2+1)^(1/2))+b/d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*b/d^
2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))^2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{1}{c^2d^2x^2-d^2}+\frac{\log(cx+1)}{d^2}+\frac{\log(cx-1)}{d^2}-\frac{2\,\log(x)}{d^2}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{c^4d^2x^5-2\,c^2d^2x^3+d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(1/(c^2*d^2*x^2 - d^2) + log(c*x + 1)/d^2 + log(c*x - 1)/d^2 - 2*log
(x)/d^2) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*
x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin(cx)+a}{c^4d^2x^5-2\,c^2d^2x^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(c^2dx^2 - d\right)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x), x)
```

3.43 $\int \frac{a+b\sin^{-1}(cx)}{x^2(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=186

$$\frac{3ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2d^2}-\frac{3ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2d^2}+\frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}-\frac{3ic\tan^{-1}(}{}$$

```
[Out] -(b*c)/(2*d^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(d^2*x*(1 - c^2*x^2)
) + (3*c^2*x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - ((3*I)*c*(a + b*A
rcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]
])/d^2 + (((3*I)/2)*b*c*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - (((3*I)/2
)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Rubi [A] time = 0.192593, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {4701, 4655, 4657, 4181, 2279, 2391, 261, 266, 51, 63, 208}

$$\frac{3ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2d^2}-\frac{3ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2d^2}+\frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}-\frac{3ic\tan^{-1}(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^2),x]
```


```
[Out] -(b*c)/(2*d^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(d^2*x*(1 - c^2*x^2)
) + (3*c^2*x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - ((3*I)*c*(a + b*A
rcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]
])/d^2 + (((3*I)/2)*b*c*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - (((3*I)/2
)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx = -\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)} + \left(3c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx + \frac{(bc)\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} + \frac{(bc)\,\text{Subst}\left(\int \frac{1}{x\left(1-c^2x\right)^{3/2}}\,dx, x, x^2\right)}{2d^2} - \frac{\left(3bc^3\right)\int \frac{}{(1-}}{2d^2}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}} - \frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} + \frac{(3c)\,\text{Subst}\left(\int (a+bx)\sec(x)\,dx\right.}{2d^2}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}} - \frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} - \frac{3ic\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin}\right.}{d^2}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}} - \frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} - \frac{3ic\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin}\right.}{d^2}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}} - \frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)} - \frac{3ic\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin}\right.}{d^2}$$

Mathematica [A] time = 0.797835, size = 348, normalized size = 1.87

$$-\frac{-6ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+6ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{2ac^2x}{c^2x^2-1}+3ac\log(1-cx)-3ac\log(cx+1)+\frac{4a}{x}+\frac{bc}{}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((4*a)/x + (b*c*Sqrt[1 - c^2*x^2])/(1 - c*x) + (b*c*Sqrt[1 - c^2*x^2])/(1
+ c*x) + (2*a*c^2*x)/(-1 + c^2*x^2) + (3*I)*b*c*Pi*ArcSin[c*x] + (4*b*ArcSi
n[c*x])/x + (b*c*ArcSin[c*x])/(-1 + c*x) + (b*c*ArcSin[c*x])/(1 + c*x) + 4*
b*c*ArcTanh[Sqrt[1 - c^2*x^2]] - 3*b*c*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 6*
b*c*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*b*c*Pi*Log[1 + I*E^(I*ArcS
in[c*x])] + 6*b*c*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a*c*Log[1 -
c*x] - 3*a*c*Log[1 + c*x] + 3*b*c*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 3*
b*c*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*b*c*PolyLog[2, (-I)*E^(I*Ar
cSin[c*x])] + (6*I)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/(4*d^2)
```

Maple [A] time = 0.193, size = 330, normalized size = 1.8

$$-\frac{ca}{4\,d^2\,(cx-1)} - \frac{3\,ca\ln(cx-1)}{4\,d^2} - \frac{ca}{4\,d^2\,(cx+1)} + \frac{3\,ca\ln(cx+1)}{4\,d^2} - \frac{a}{d^2x} - \frac{3\,b\arcsin(cx)\,c^2x}{2\,d^2\left(c^2x^2-1\right)} + \frac{bc}{2\,d^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4*c*a/d^2/(c*x-1)-3/4*c*a/d^2*ln(c*x-1)-1/4*c*a/d^2/(c*x+1)+3/4*c*a/d^2*
ln(c*x+1)-a/d^2/x-3/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c^2*x+1/2*c*b/d^2/(c^2*
```

```
x^2-1)*(-c^2*x^2+1)^(1/2)+b/d^2/x/(c^2*x^2-1)*arcsin(c*x)+c*b/d^2*ln(I*c*x+
(-c^2*x^2+1)^(1/2)-1)-c*b/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3/2*I*c*b/d^2*
dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*c*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))-3/2*I*c*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3
/2*c*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a\left(\frac{2\left(3c^2x^2-2\right)}{c^2d^2x^3-d^2x}-\frac{3c\log\left(cx+1\right)}{d^2}+\frac{3c\log\left(cx-1\right)}{d^2}\right)+\frac{\left(3\left(c^3x^3-cx\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\log\left(cx+1\right)-3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*(3*c^2*x^2 - 2)/(c^2*d^2*x^3 - d^2*x) - 3*c*log(c*x + 1)/d^2 + 3*
c*log(c*x - 1)/d^2) + 1/4*(3*(c^3*x^3 - c*x)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))*log(c*x + 1) - 3*(c^3*x^3 - c*x)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))*log(-c*x + 1) - 2*(3*c^2*x^2 - 2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + 4*(c^2*d^2*x^3 - d^2*x)*integrate(-1/4*(6*c^3*x^2 - 3*(c^
4*x^3 - c^2*x)*log(c*x + 1) + 3*(c^4*x^3 - c^2*x)*log(-c*x + 1) - 4*c)*sqrt
(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x))*b/(c^2*
d^2*x^3 - d^2*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin\left(cx\right)+a}{c^4d^2x^6-2c^2d^2x^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{a}{c^4x^6-2c^2x^4+x^2}\,dx+\int\frac{b\operatorname{asin}\left(cx\right)}{c^4x^6-2c^2x^4+x^2}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(b*asin(c*x)/(c*
*4*x**6 - 2*c**2*x**4 + x**2), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(c^2dx^2 - d\right)^2 x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x^2), x)
```

3.44 $\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=159

$$\frac{ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{d^2}-\frac{ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{d^2}+\frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}-\frac{4c^2\tanh^{-1}\left(e^{2i}\right.}{}$$

```
[Out] -(b*c)/(2*d^2*x*Sqrt[1 - c^2*x^2]) + (c^2*(a + b*ArcSin[c*x]))/(d^2*(1 - c^
2*x^2)) - (a + b*ArcSin[c*x])/(2*d^2*x^2*(1 - c^2*x^2)) - (4*c^2*(a + b*Arc
Sin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (I*b*c^2*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/d^2 - (I*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rubi [A] time = 0.264022, antiderivative size = 159, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {4701, 4705, 4679, 4419, 4183, 2279, 2391, 191, 271}

$$\frac{ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{d^2}-\frac{ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{d^2}+\frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}-\frac{4c^2\tanh^{-1}\left(e^{2i}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] -(b*c)/(2*d^2*x*Sqrt[1 - c^2*x^2]) + (c^2*(a + b*ArcSin[c*x]))/(d^2*(1 - c^
2*x^2)) - (a + b*ArcSin[c*x])/(2*d^2*x^2*(1 - c^2*x^2)) - (4*c^2*(a + b*Arc
Sin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (I*b*c^2*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/d^2 - (I*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^2}\,dx = -\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)} + \left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^2}\,dx + \frac{(bc)\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^2}$$

$$= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)} + \frac{\left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)}\,dx}{d}$$

$$= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)} + \frac{\left(2c^2\right)\text{Subst}\left(\int (a+bx)\csc(x)\sec(\right.}{d^2}$$

$$= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)} + \frac{\left(4c^2\right)\text{Subst}\left(\int (a+bx)\csc(2x)\,dx,\right.}{d^2}$$

$$= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin}\right.}{d^2}$$

$$= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin}\right.}{d^2}$$

$$= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(1-c^2x^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin}\right.}{d^2}$$

Mathematica [A] time = 0.721667, size = 213, normalized size = 1.34

$$-\frac{-2ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right) + 2ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) + \frac{ac^2}{c^2x^2-1} + 2ac^2\log\left(1-c^2x^2\right) - 4ac^2\log(x) + \frac{a}{x^2} + \frac{bc}{\sqrt{1-}}}{2d^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] -(a/x^2 + (b*c^3*x)/Sqrt[1 - c^2*x^2] + (b*c*Sqrt[1 - c^2*x^2])/x + (a*c^2)
/(-1 + c^2*x^2) + (b*ArcSin[c*x])/x^2 + (b*c^2*ArcSin[c*x])/(-1 + c^2*x^2)
- 4*b*c^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 4*b*c^2*ArcSin[c*x]*
Log[1 + E^((2*I)*ArcSin[c*x])] - 4*a*c^2*Log[x] + 2*a*c^2*Log[1 - c^2*x^2]
- (2*I)*b*c^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + (2*I)*b*c^2*PolyLog[2, E
^((2*I)*ArcSin[c*x])])/(2*d^2)
```

Maple [A] time = 0.184, size = 367, normalized size = 2.3

$$-\frac{c^2a}{4\,d^2\,(cx-1)} - \frac{c^2a\ln(cx-1)}{d^2} + \frac{c^2a}{4\,d^2\,(cx+1)} - \frac{c^2a\ln(cx+1)}{d^2} - \frac{a}{2\,d^2x^2} + 2\,\frac{c^2a\ln(cx)}{d^2} - \frac{c^2b\arcsin(cx)}{d^2\left(c^2x^2-1\right)} + \frac{bc}{2\,d^2x\left(c^2x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4*c^2*a/d^2/(c*x-1)-c^2*a/d^2*ln(c*x-1)+1/4*c^2*a/d^2/(c*x+1)-c^2*a/d^2*
ln(c*x+1)-1/2*a/d^2/x^2+2*c^2*a/d^2*ln(c*x)-c^2*b/d^2/(c^2*x^2-1)*arcsin(c*
x)+1/2*c*b/d^2/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+1/2*b/d^2/x^2/(c^2*x^2-1)*a
```

```
rcsin(c*x)+2*c^2*b/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*c^2*b/d
^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*c^2*b/d^2*arcsin(c*x)*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b*c^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))
^2)/d^2-2*I*c^2*b/d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*c^2*b/d^2*po
lylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{2\,c^2\log\left(cx+1\right)}{d^2}+\frac{2\,c^2\log\left(cx-1\right)}{d^2}-\frac{4\,c^2\log\left(x\right)}{d^2}+\frac{2\,c^2x^2-1}{c^2d^2x^4-d^2x^2}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{c^4d^2x^7-2\,c^2d^2x^5+d^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*c^2*log(c*x + 1)/d^2 + 2*c^2*log(c*x - 1)/d^2 - 4*c^2*log(x)/d^2
+ (2*c^2*x^2 - 1)/(c^2*d^2*x^4 - d^2*x^2)) + b*integrate(arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin\left(cx\right)+a}{c^4d^2x^7-2\,c^2d^2x^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{a}{c^4x^7-2c^2x^5+x^3}\,dx+\int\frac{b\,\mathrm{asin}\left(cx\right)}{c^4x^7-2c^2x^5+x^3}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(b*asin(c*x)/(c*
*4*x**7 - 2*c**2*x**5 + x**3), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x^3), x)
```

3.45 $\int \frac{a+b\sin^{-1}(cx)}{x^4(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=259

$$\frac{5ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2d^2}-\frac{5ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2d^2}+\frac{5c^4x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}-\frac{a}{3d^2}$$

```
[Out] -(b*c^3)/(3*d^2*Sqrt[1 - c^2*x^2]) - (b*c)/(6*d^2*x^2*Sqrt[1 - c^2*x^2]) -
(a + b*ArcSin[c*x])/(3*d^2*x^3*(1 - c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x]))
/(3*d^2*x*(1 - c^2*x^2)) + (5*c^4*x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^
2)) - ((5*I)*c^3*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (13*b
*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d^2) + (((5*I)/2)*b*c^3*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/d^2 - (((5*I)/2)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])]
)/d^2
```

Rubi [A] time = 0.307726, antiderivative size = 285, normalized size of antiderivative = 1.1, number of steps used = 19, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {4701, 4655, 4657, 4181, 2279, 2391, 261, 266, 51, 63, 208}

$$\frac{5ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{2d^2}-\frac{5ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{2d^2}+\frac{5c^4x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}-\frac{a}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] (-5*b*c^3)/(6*d^2*Sqrt[1 - c^2*x^2]) + (b*c)/(3*d^2*x^2*Sqrt[1 - c^2*x^2])
- (b*c*Sqrt[1 - c^2*x^2])/(2*d^2*x^2) - (a + b*ArcSin[c*x])/(3*d^2*x^3*(1 -
 c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x]))/(3*d^2*x*(1 - c^2*x^2)) + (5*c^4*x
*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - ((5*I)*c^3*(a + b*ArcSin[c*x]
)*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (13*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6
*d^2) + (((5*I)/2)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - (((5*I)/
2)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

```
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx = -\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}+\frac{1}{3}\left(5c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\int \frac{1}{x^3\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}+\left(5c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\,\text{Subst}\left(\int \frac{}{x^2(1-}\right.}{6d^2}$$

$$= \frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}+\frac{5c^4x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}+\frac{(bc)\,\text{S}}{}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{3d^2x\left(1-c^2x^2\right)}$$

Mathematica [A] time = 0.929428, size = 426, normalized size = 1.64

$$-\frac{-30ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+30ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{6ac^4x}{c^2x^2-1}+\frac{24ac^2}{x}+15ac^3\log(1-cx)-15ac^3\log(c}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((4*a)/x^3 + (24*a*c^2)/x + (2*b*c*Sqrt[1 - c^2*x^2])/x^2 - (3*b*c^3*Sqrt[
1 - c^2*x^2])/(-1 + c*x) + (3*b*c^3*Sqrt[1 - c^2*x^2])/(1 + c*x) + (6*a*c^4
*x)/(-1 + c^2*x^2) + (15*I)*b*c^3*Pi*ArcSin[c*x] + (4*b*ArcSin[c*x])/x^3 +
(24*b*c^2*ArcSin[c*x])/x + (3*b*c^3*ArcSin[c*x])/(-1 + c*x) + (3*b*c^3*ArcS
in[c*x])/(1 + c*x) + 26*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 15*b*c^3*Pi*Log[
1 - I*E^(I*ArcSin[c*x])] - 30*b*c^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])
] - 15*b*c^3*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 30*b*c^3*ArcSin[c*x]*Log[1 +
 I*E^(I*ArcSin[c*x])] + 15*a*c^3*Log[1 - c*x] - 15*a*c^3*Log[1 + c*x] + 15*
b*c^3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 15*b*c^3*Pi*Log[Sin[(Pi + 2*Ar
cSin[c*x])/4]] - (30*I)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (30*I)*b
*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/(12*d^2)
```

Maple [A] time = 0.23, size = 426, normalized size = 1.6

$$-\frac{c^3a}{4\,d^2\,(cx-1)}-\frac{5\,c^3a\ln(cx-1)}{4\,d^2}-\frac{c^3a}{4\,d^2\,(cx+1)}+\frac{5\,c^3a\ln(cx+1)}{4\,d^2}-\frac{a}{3\,d^2x^3}-2\,\frac{c^2a}{d^2x}-\frac{5\,c^4b\arcsin(cx)\,x}{2\,d^2\,(c^2x^2-1)}+\frac{bc^3}{3\,d^2\,(c^2x^2-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4*c^3*a/d^2/(c*x-1)-5/4*c^3*a/d^2*ln(c*x-1)-1/4*c^3*a/d^2/(c*x+1)+5/4*c^
3*a/d^2*ln(c*x+1)-1/3*a/d^2/x^3-2*c^2*a/d^2/x-5/2*c^4*b/d^2/(c^2*x^2-1)*arc
sin(c*x)*x+1/3*c^3*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+5/3*c^2*b/d^2/x/(c^
2*x^2-1)*arcsin(c*x)+1/6*c*b/d^2/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+1/3*b/d
^2/x^3/(c^2*x^2-1)*arcsin(c*x)+13/6*c^3*b/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1
)-13/6*c^3*b/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-5/2*c^3*b/d^2*arcsin(c*x)*l
n(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/2*I*c^3*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^
2+1)^(1/2)))-5/2*I*c^3*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/2*c^3*
b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{12}\left(\frac{15\,c^3\log(cx+1)}{d^2}-\frac{15\,c^3\log(cx-1)}{d^2}-\frac{2\left(15\,c^4x^4-10\,c^2x^2-2\right)}{c^2d^2x^5-d^2x^3}\right)a+\frac{\left(15\left(c^5x^5-c^3x^3\right)\operatorname{arctan}\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/12*(15*c^3*log(c*x + 1)/d^2 - 15*c^3*log(c*x - 1)/d^2 - 2*(15*c^4*x^4 - 1
0*c^2*x^2 - 2)/(c^2*d^2*x^5 - d^2*x^3))*a + 1/12*(15*(c^5*x^5 - c^3*x^3)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(c^5*x^5 - c^3*x
^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(15*c^4*x^
4 - 10*c^2*x^2 - 2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 12*(c^2*d^
2*x^5 - d^2*x^3)*integrate(-1/12*(30*c^5*x^4 - 20*c^3*x^2 - 15*(c^6*x^5 - c
^4*x^3)*log(c*x + 1) + 15*(c^6*x^5 - c^4*x^3)*log(-c*x + 1) - 4*c)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x))*b/(c^2*d^
2*x^5 - d^2*x^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{b\arcsin(cx)+a}{c^4d^2x^8-2\,c^2d^2x^6+d^2x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{a}{c^4x^8-2c^2x^6+x^4}\,dx + \int \frac{b\,\mathrm{asin}\,(cx)}{c^4x^8-2c^2x^6+x^4}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(b*asin(c*x)/(c*
*4*x**8 - 2*c**2*x**6 + x**4), x))/d**2
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.46 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=204

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8c^5d^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8c^5d^3}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x\left(a+b\sin^{-1}(cx)\right)}{8c^4d^3\left(1-c^2x^2\right)}-\frac{3i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\ldots}{}$$

```
[Out] -b/(12*c^5*d^3*(1 - c^2*x^2)^(3/2)) + (5*b)/(8*c^5*d^3*Sqrt[1 - c^2*x^2]) +
 (x^3*(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*ArcSin
[c*x]))/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan[E
^(I*ArcSin[c*x])])/(c^5*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x
])])/(c^5*d^3) - (((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^3)
```

Rubi [A] time = 0.240689, antiderivative size = 204, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4703, 4657, 4181, 2279, 2391, 261, 266, 43}

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8c^5d^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8c^5d^3}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x\left(a+b\sin^{-1}(cx)\right)}{8c^4d^3\left(1-c^2x^2\right)}-\frac{3i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -b/(12*c^5*d^3*(1 - c^2*x^2)^(3/2)) + (5*b)/(8*c^5*d^3*Sqrt[1 - c^2*x^2]) +
 (x^3*(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*ArcSin
[c*x]))/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan[E
^(I*ArcSin[c*x])])/(c^5*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x
])])/(c^5*d^3) - (((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^3)
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{x^3}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4cd^3} - \frac{3\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx}{4c^2d}$$

$$= \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8c^4d^3\left(1-c^2x^2\right)} + \frac{(3b)\int \frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{8c^3d^3} - \frac{b\,\text{Subst}\left(\int \frac{x}{\left(1-c^2x\right)^{5/2}}\right.}{8cd^3}$$

$$= \frac{3b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8c^4d^3\left(1-c^2x^2\right)} + \frac{3\,\text{Subst}\left(\int(a+bx)\sec(\right.}{8c^5d^3}$$

$$= -\frac{b}{12c^5d^3\left(1-c^2x^2\right)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8c^4d^3\left(1-c^2x^2\right)} -$$

$$= -\frac{b}{12c^5d^3\left(1-c^2x^2\right)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8c^4d^3\left(1-c^2x^2\right)} -$$

$$= -\frac{b}{12c^5d^3\left(1-c^2x^2\right)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8c^4d^3\left(1-c^2x^2\right)} -$$

Mathematica [B] time = 1.07112, size = 445, normalized size = 2.18

$$18ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-18ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{30acx}{c^2x^2-1}+\frac{12acx}{\left(c^2x^2-1\right)^2}-9a\log(1-cx)+9a\log(cx+1)-\frac{15b\sqrt{1}}{cx}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((-2*b*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 + (b*c*x*Sqrt[1 - c^2*x^2])/(-1 + c*
x)^2 - (15*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*b*Sqrt[1 - c^2*x^2])/(1 + c
*x)^2 - (b*c*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (15*b*Sqrt[1 - c^2*x^2])/(1
 + c*x) + (12*a*c*x)/(-1 + c^2*x^2)^2 + (30*a*c*x)/(-1 + c^2*x^2) - (9*I)*b
*Pi*ArcSin[c*x] + (3*b*ArcSin[c*x])/(-1 + c*x)^2 + (15*b*ArcSin[c*x])/(-1 +
 c*x) - (3*b*ArcSin[c*x])/(1 + c*x)^2 + (15*b*ArcSin[c*x])/(1 + c*x) + 9*b*
Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 18*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*
x])] + 9*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 18*b*ArcSin[c*x]*Log[1 + I*E^(
I*ArcSin[c*x])] - 9*a*Log[1 - c*x] + 9*a*Log[1 + c*x] - 9*b*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] - 9*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (18*I)*b*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (18*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x]
)])/(48*c^5*d^3)
```

Maple [A] time = 0.378, size = 389, normalized size = 1.9

$$\frac{a}{16\,c^5d^3\,(cx-1)^2}+\frac{5\,a}{16\,c^5d^3\,(cx-1)}-\frac{3\,a\ln(cx-1)}{16\,c^5d^3}-\frac{a}{16\,c^5d^3\,(cx+1)^2}+\frac{5\,a}{16\,c^5d^3\,(cx+1)}+\frac{3\,a\ln(cx+1)}{16\,c^5d^3}+\frac{5\,b\,\mathrm{arcs}}{8\,c^2d^3\left(c^4x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16/c^5*a/d^3/(c*x-1)^2+5/16/c^5*a/d^3/(c*x-1)-3/16/c^5*a/d^3*ln(c*x-1)-1/
16/c^5*a/d^3/(c*x+1)^2+5/16/c^5*a/d^3/(c*x+1)+3/16/c^5*a/d^3*ln(c*x+1)+5/8/
c^2*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x^3-5/8/c^3*b/d^3/(c^4*x^4-2*c^
2*x^2+1)*x^2*(-c^2*x^2+1)^(1/2)-3/8/c^4*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(
c*x)*x+13/24/c^5*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-3/8/c^5*b/d
^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/8/c^5*b/d^3*arcsin(c*x)
*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/8*I/c^5*b/d^3*dilog(1+I*(I*c*x+(-c^2*
x^2+1)^(1/2)))-3/8*I/c^5*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{16}a\left(\frac{2\left(5\,c^2x^3-3\,x\right)}{c^8d^3x^4-2\,c^6d^3x^2+c^4d^3}+\frac{3\,\log(cx+1)}{c^5d^3}-\frac{3\,\log(cx-1)}{c^5d^3}\right)+\frac{\left(3\left(c^4x^4-2\,c^2x^2+1\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a*(2*(5*c^2*x^3 - 3*x)/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 3*log
(c*x + 1)/(c^5*d^3) - 3*log(c*x - 1)/(c^5*d^3)) + 1/16*(3*(c^4*x^4 - 2*c^2*
```

```
x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^4*x
^4 - 2*c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1
) + 2*(5*c^3*x^3 - 3*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(
c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)*integrate(1/16*(10*c^3*x^3 - 6*c*x +
 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log(c*x + 1) - 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log
(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^10*d^3*x^6 - 3*c^8*d^3*x^4 + 3*
c^6*d^3*x^2 - c^4*d^3), x))*b/(c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{bx^4 \arcsin(cx) + ax^4}{c^6d^3x^6 - 3\,c^4d^3x^4 + 3\,c^2d^3x^2 - d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*
d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{ax^4}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{bx^4 \operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**4/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**4*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx) + a)x^4}{\left(c^2dx^2 - d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d)^3, x)
```

3.47 $\int \frac{x^3(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=100

$$\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{bx^3}{12cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx}{4c^3d^3\sqrt{1-c^2x^2}}-\frac{b\sin^{-1}(cx)}{4c^4d^3}$$

```
[Out] -(b*x^3)/(12*c*d^3*(1 - c^2*x^2)^(3/2)) + (b*x)/(4*c^3*d^3*Sqrt[1 - c^2*x^2
]) - (b*ArcSin[c*x])/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^
2*x^2)^2)
```

Rubi [A] time = 0.0844497, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12, Rules used = {4681, 288, 216}

$$\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{bx^3}{12cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx}{4c^3d^3\sqrt{1-c^2x^2}}-\frac{b\sin^{-1}(cx)}{4c^4d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```


```
[Out] -(b*x^3)/(12*c*d^3*(1 - c^2*x^2)^(3/2)) + (b*x)/(4*c^3*d^3*Sqrt[1 - c^2*x^2
]) - (b*ArcSin[c*x])/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^
2*x^2)^2)
```


Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{x^4}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4d^3}$$

$$= -\frac{bx^3}{12cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} + \frac{b\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{4cd^3}$$

$$= -\frac{bx^3}{12cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{bx}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c^3d^3}$$

$$= -\frac{bx^3}{12cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{bx}{4c^3d^3\sqrt{1-c^2x^2}} - \frac{b\sin^{-1}(cx)}{4c^4d^3} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}$$

Mathematica [A] time = 0.0726101, size = 79, normalized size = 0.79

$$\frac{a\left(6c^2x^2-3\right)+bcx\sqrt{1-c^2x^2}\left(3-4c^2x^2\right)+3b\left(2c^2x^2-1\right)\sin^{-1}(cx)}{12c^4d^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] (b*c*x*(3 - 4*c^2*x^2)*Sqrt[1 - c^2*x^2] + a*(-3 + 6*c^2*x^2) + 3*b*(-1 + 2
*c^2*x^2)*ArcSin[c*x])/(12*c^4*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] time = 0.02, size = 212, normalized size = 2.1

$$\frac{1}{c^4}\left(-\frac{a}{d^3}\left(-\frac{1}{16\,(cx-1)^2}-\frac{3}{16\,cx-16}-\frac{1}{16\,(cx+1)^2}+\frac{3}{16\,cx+16}\right)-\frac{b}{d^3}\left(-\frac{\arcsin(cx)}{16\,(cx-1)^2}-\frac{3\,\arcsin(cx)}{16\,cx-16}-\frac{\arcsin(cx)}{16\,(cx+1)}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/c^4*(-a/d^3*(-1/16/(c*x-1)^2-3/16/(c*x-1)-1/16/(c*x+1)^2+3/16/(c*x+1))-b/
d^3*(-1/16*arcsin(c*x)/(c*x-1)^2-3/16*arcsin(c*x)/(c*x-1)-1/16*arcsin(c*x)/
(c*x+1)^2+3/16*arcsin(c*x)/(c*x+1)+1/6/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1
/6/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)+1/48/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(
1/2)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{\left(2\,c^2x^2-1\right)a}{4\left(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3\right)} + \frac{\left(\left(2\,c^2x^2-1\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+\left(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3\right)\int \frac{}{c^{11}d^3x^8-3\,c^9d}\right.}{4\left(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(2*c^2*x^2 - 1)*a/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 1/4*((2*c^2
*x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 4*(c^8*d^3*x^4 - 2*c
^6*d^3*x^2 + c^4*d^3)*integrate(1/4*(2*c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1
/2*log(-c*x + 1))/(c^11*d^3*x^8 - 3*c^9*d^3*x^6 + 3*c^7*d^3*x^4 - c^5*d^3*x
^2 + (c^9*d^3*x^6 - 3*c^7*d^3*x^4 + 3*c^5*d^3*x^2 - c^3*d^3)*e^(log(c*x + 1
) + log(-c*x + 1))), x))*b/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)
```

Fricas [A] time = 2.09677, size = 188, normalized size = 1.88

$$\frac{3\,ac^4x^4 + 3\left(2\,bc^2x^2 - b\right)\arcsin\left(cx\right) - \left(4\,bc^3x^3 - 3\,bcx\right)\sqrt{-c^2x^2 + 1}}{12\left(c^8d^3x^4 - 2\,c^6d^3x^2 + c^4d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*c^4*x^4 + 3*(2*b*c^2*x^2 - b)*arcsin(c*x) - (4*b*c^3*x^3 - 3*b*c*
x)*sqrt(-c^2*x^2 + 1))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{ax^3}{c^6x^6 - 3c^4x^4 + 3c^2x^2 - 1}\,dx + \int \frac{bx^3\operatorname{asin}\left(cx\right)}{c^6x^6 - 3c^4x^4 + 3c^2x^2 - 1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**3/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**3*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [A] time = 1.368, size = 167, normalized size = 1.67

$$\frac{bx^4\arcsin\left(cx\right)}{4\left(c^2x^2 - 1\right)^2d^3} + \frac{ax^4}{4\left(c^2x^2 - 1\right)^2d^3} + \frac{bx^3}{12\left(c^2x^2 - 1\right)\sqrt{-c^2x^2 + 1}cd^3} + \frac{bx}{4\sqrt{-c^2x^2 + 1}c^3d^3} - \frac{b\arcsin\left(cx\right)}{4\,c^4d^3} - \frac{a}{4\,c^4d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b*x^4*arcsin(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a*x^4/((c^2*x^2 - 1)^2*d^
3) + 1/12*b*x^3/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b*x/(sqrt(-c
^2*x^2 + 1)*c^3*d^3) - 1/4*b*arcsin(c*x)/(c^4*d^3) - 1/4*a/(c^4*d^3)
```

3.48 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=202

$$-\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8c^3d^3}+\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8c^3d^3}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{8c^2d^3\left(1-c^2x^2\right)}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2}+\frac{i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right.}{}$$

```
[Out] -b/(12*c^3*d^3*(1 - c^2*x^2)^(3/2)) + b/(8*c^3*d^3*Sqrt[1 - c^2*x^2]) + (x*
(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c*x]))/
(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c^3*d^3) - ((I/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3) +
 ((I/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3)
```

Rubi [A] time = 0.183918, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {4703, 4655, 4657, 4181, 2279, 2391, 261}

$$-\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8c^3d^3}+\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8c^3d^3}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{8c^2d^3\left(1-c^2x^2\right)}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2}+\frac{i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```


```
[Out] -b/(12*c^3*d^3*(1 - c^2*x^2)^(3/2)) + b/(8*c^3*d^3*Sqrt[1 - c^2*x^2]) + (x*
(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c*x]))/
(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c^3*d^3) - ((I/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3) +
 ((I/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3)
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{x}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4cd^3} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx}{4c^2d}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x\left(a+b\sin^{-1}(cx)\right)}{8c^2d^3\left(1-c^2x^2\right)} + \frac{b\int \frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{8cd^3} - \ldots$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x\left(a+b\sin^{-1}(cx)\right)}{8c^2d^3\left(1-c^2x^2\right)} - \text{Subs}\ldots$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x\left(a+b\sin^{-1}(cx)\right)}{8c^2d^3\left(1-c^2x^2\right)} + \frac{i\left(a+\ldots\right.}{\ldots}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x\left(a+b\sin^{-1}(cx)\right)}{8c^2d^3\left(1-c^2x^2\right)} + \frac{i\left(a+\ldots\right.}{\ldots}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x\left(a+b\sin^{-1}(cx)\right)}{8c^2d^3\left(1-c^2x^2\right)} + \frac{i\left(a+\ldots\right.}{\ldots}$$

Mathematica [B] time = 0.706753, size = 445, normalized size = 2.2

$$-6ib\,\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+6ib\,\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{6acx}{c^2x^2-1}+\frac{12acx}{\left(c^2x^2-1\right)^2}+3a\log(1-cx)-3a\log(cx+1)-\frac{3b\sqrt{1-\ldots}}{cx-\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((-2*b*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 + (b*c*x*Sqrt[1 - c^2*x^2])/(-1 + c*
x)^2 - (3*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*b*Sqrt[1 - c^2*x^2])/(1 + c*
x)^2 - (b*c*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (3*b*Sqrt[1 - c^2*x^2])/(1 +
 c*x) + (12*a*c*x)/(-1 + c^2*x^2)^2 + (6*a*c*x)/(-1 + c^2*x^2) + (3*I)*b*Pi
*ArcSin[c*x] + (3*b*ArcSin[c*x])/(-1 + c*x)^2 + (3*b*ArcSin[c*x])/(-1 + c*x
) - (3*b*ArcSin[c*x])/(1 + c*x)^2 + (3*b*ArcSin[c*x])/(1 + c*x) - 3*b*Pi*Lo
g[1 - I*E^(I*ArcSin[c*x])] - 6*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] -
 3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSi
n[c*x])] + 3*a*Log[1 - c*x] - 3*a*Log[1 + c*x] + 3*b*Pi*Log[-Cos[(Pi + 2*Ar
cSin[c*x])/4]] + 3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*b*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(48*c
^3*d^3)
```

Maple [A] time = 0.3, size = 386, normalized size = 1.9

$$\frac{a}{16\,c^{3}d^{3}\left(cx-1\right)^{2}}+\frac{a}{16\,c^{3}d^{3}\left(cx-1\right)}+\frac{a\ln\left(cx-1\right)}{16\,c^{3}d^{3}}-\frac{a}{16\,c^{3}d^{3}\left(cx+1\right)^{2}}+\frac{a}{16\,c^{3}d^{3}\left(cx+1\right)}-\frac{a\ln\left(cx+1\right)}{16\,c^{3}d^{3}}+\frac{b\arcsin}{8\,d^{3}\left(c^{4}x^{4}-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16/c^3*a/d^3/(c*x-1)^2+1/16/c^3*a/d^3/(c*x-1)+1/16/c^3*a/d^3*ln(c*x-1)-1/
16/c^3*a/d^3/(c*x+1)^2+1/16/c^3*a/d^3/(c*x+1)-1/16/c^3*a/d^3*ln(c*x+1)+1/8*
b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x^3-1/8/c*b/d^3/(c^4*x^4-2*c^2*x^2+
1)*x^2*(-c^2*x^2+1)^(1/2)+1/8/c^2*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x
+1/24/c^3*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)+1/8/c^3*b/d^3*arcs
in(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/8/c^3*b/d^3*arcsin(c*x)*ln(1-I
*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/8*I/c^3*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^
(1/2)))+1/8*I/c^3*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{16}\,a\left(\frac{2\left(c^{2}x^{3}+x\right)}{c^{6}d^{3}x^{4}-2\,c^{4}d^{3}x^{2}+c^{2}d^{3}}-\frac{\log\left(cx+1\right)}{c^{3}d^{3}}+\frac{\log\left(cx-1\right)}{c^{3}d^{3}}\right)-\frac{\left(\left(c^{4}x^{4}-2\,c^{2}x^{2}+1\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a*(2*(c^2*x^3 + x)/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) - log(c*x +
 1)/(c^3*d^3) + log(c*x - 1)/(c^3*d^3)) - 1/16*((c^4*x^4 - 2*c^2*x^2 + 1)*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (c^4*x^4 - 2*c^2*x
^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(c^3*x
^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^7*d^3*x^4 - 2*
c^5*d^3*x^2 + c^3*d^3)*integrate(-1/16*(2*c^3*x^3 + 2*c*x - (c^4*x^4 - 2*c^
2*x^2 + 1)*log(c*x + 1) + (c^4*x^4 - 2*c^2*x^2 + 1)*log(-c*x + 1))*sqrt(c*x
 + 1)*sqrt(-c*x + 1)/(c^8*d^3*x^6 - 3*c^6*d^3*x^4 + 3*c^4*d^3*x^2 - c^2*d^3
```

```
), x))*b/(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{bx^2 \arcsin(cx) + ax^2}{c^6d^3x^6 - 3\,c^4d^3x^4 + 3\,c^2d^3x^2 - d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^2*arcsin(c*x) + a*x^2)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*
d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{ax^2}{c^6x^6-3c^4x^4+3c^2x^2-1}\, dx + \int \frac{bx^2 \operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\, dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**2*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)x^2}{\left(c^2dx^2 - d\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d)^3, x)
```

3.49 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=83

$$\frac{a+b\sin^{-1}(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{bx}{6cd^3\sqrt{1-c^2x^2}}-\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}}$$

```
[Out] -(b*x)/(12*c*d^3*(1 - c^2*x^2)^(3/2)) - (b*x)/(6*c*d^3*Sqrt[1 - c^2*x^2]) +
 (a + b*ArcSin[c*x])/(4*c^2*d^3*(1 - c^2*x^2)^2)
```

Rubi [A] time = 0.0539175, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {4677, 192, 191}

$$\frac{a+b\sin^{-1}(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{bx}{6cd^3\sqrt{1-c^2x^2}}-\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -(b*x)/(12*c*d^3*(1 - c^2*x^2)^(3/2)) - (b*x)/(6*c*d^3*Sqrt[1 - c^2*x^2]) +
 (a + b*ArcSin[c*x])/(4*c^2*d^3*(1 - c^2*x^2)^2)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx = \frac{a+b\sin^{-1}(cx)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{1}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4cd^3}$$

$$= -\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{6cd^3}$$

$$= -\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{bx}{6cd^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}$$

Mathematica [A] time = 0.100991, size = 62, normalized size = 0.75

$$\frac{\frac{a+b\sin^{-1}(cx)}{\left(c^2x^2-1\right)^2} + \frac{bcx\left(2c^2x^2-3\right)}{3\left(1-c^2x^2\right)^{3/2}}}{4c^2d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((b*c*x*(-3 + 2*c^2*x^2))/(3*(1 - c^2*x^2)^(3/2)) + (a + b*ArcSin[c*x])/(-1
 + c^2*x^2)^2)/(4*c^2*d^3)
```

Maple [B] time = 0.01, size = 151, normalized size = 1.8

$$\frac{1}{c^2}\left(\frac{a}{4\,d^3\left(c^2x^2-1\right)^2} - \frac{b}{d^3}\left(-\frac{\arcsin(cx)}{4\left(c^2x^2-1\right)^2} - \frac{1}{12\,cx-12}\sqrt{-(cx-1)^2-2\,cx+2} - \frac{1}{12\,cx+12}\sqrt{-(cx+1)^2+2\,cx+2} + \frac{}{48}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/c^2*(1/4*a/d^3/(c^2*x^2-1)^2-b/d^3*(-1/4/(c^2*x^2-1)^2*arcsin(c*x)-1/12/(
c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)-1/12/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)+1
/48/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2
)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{\left(\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)\int \frac{e^{\left(\frac{1}{2}\log(cx+1)+\frac{1}{2}\log(-cx+1)\right)}}{c^9d^3x^8-3\,c^7d^3x^6+3\,c^5d^3x^4-c^3d^3x^2-\left(c^7d^3x^6-3\,c^5d^3x^4+3\,c^3d^3x^2-cd^3\right)(cx+1)(cx-1)}\,dx + \arctan\left(cx, \sqrt{cx+1}\sqrt{-}\right.\right.}{4\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(4*(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)*integrate(1/4*e^(1/2*log(c*x
 + 1) + 1/2*log(-c*x + 1))/(c^9*d^3*x^8 - 3*c^7*d^3*x^6 + 3*c^5*d^3*x^4 - c
```

```
^3*d^3*x^2 + (c^7*d^3*x^6 - 3*c^5*d^3*x^4 + 3*c^3*d^3*x^2 - c*d^3)*e^(log(c
*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
*b/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) + 1/4*a/(c^6*d^3*x^4 - 2*c^4*d^3
*x^2 + c^2*d^3)
```

Fricas [A] time = 2.26994, size = 186, normalized size = 2.24

$$-\frac{3\,ac^4x^4-6\,ac^2x^2-3\,b\arcsin\left(cx\right)-\left(2\,bc^3x^3-3\,bcx\right)\sqrt{-c^2x^2+1}}{12\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] -1/12*(3*a*c^4*x^4 - 6*a*c^2*x^2 - 3*b*arcsin(c*x) - (2*b*c^3*x^3 - 3*b*c*x
)*sqrt(-c^2*x^2 + 1))/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{ax}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{bx\operatorname{asin}\left(cx\right)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integral(b
*x*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [B] time = 1.32488, size = 232, normalized size = 2.8

$$\frac{bc^2x^4\arcsin\left(cx\right)}{4\left(c^2x^2-1\right)^2d^3}+\frac{ac^2x^4}{4\left(c^2x^2-1\right)^2d^3}+\frac{bcx^3}{12\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}d^3}-\frac{bx^2\arcsin\left(cx\right)}{2\left(c^2x^2-1\right)d^3}-\frac{ax^2}{2\left(c^2x^2-1\right)d^3}-\frac{bx}{4\sqrt{-c^2x^2+1}c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b*c^2*x^4*arcsin(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a*c^2*x^4/((c^2*x^2 -
 1)^2*d^3) + 1/12*b*c*x^3/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*d^3) - 1/2*b*x^
2*arcsin(c*x)/((c^2*x^2 - 1)*d^3) - 1/2*a*x^2/((c^2*x^2 - 1)*d^3) - 1/4*b*x
/(sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b*arcsin(c*x)/(c^2*d^3) + 1/4*a/(c^2*d^3)
```

3.50 $\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=196

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8cd^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8cd^3}+\frac{3x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{3i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{}$$

```
[Out] -b/(12*c*d^3*(1 - c^2*x^2)^(3/2)) - (3*b)/(8*c*d^3*Sqrt[1 - c^2*x^2]) + (x*
(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x]))/(8
*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x
])])/(c*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) - (
((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3)
```

Rubi [A] time = 0.133682, antiderivative size = 196, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4655, 4657, 4181, 2279, 2391, 261}

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8cd^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8cd^3}+\frac{3x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{3i\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^3,x]
```

```
[Out] -b/(12*c*d^3*(1 - c^2*x^2)^(3/2)) - (3*b)/(8*c*d^3*Sqrt[1 - c^2*x^2]) + (x*
(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x]))/(8
*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x
])])/(c*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) - (
((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3)
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{x}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4d^3} + \frac{3\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx}{4d}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)} - \frac{(3bc)\int \frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{8d^3} + \frac{3 \ldots}{\ldots}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)} + \frac{3\,\mathrm{Subst} \ldots}{\ldots}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)} - \frac{3i\left(a+b \ldots\right.}{\ldots}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)} - \frac{3i\left(a+b \ldots\right.}{\ldots}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)} - \frac{3i\left(a+b \ldots\right.}{\ldots}$$

Mathematica [B] time = 1.54429, size = 501, normalized size = 2.56

$$-\frac{-\frac{6ib\,\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c} + \frac{6ib\,\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c} + \frac{6ax}{c^2x^2-1} - \frac{4ax}{\left(c^2x^2-1\right)^2} + \frac{3a\log(1-cx)}{c} - \frac{3a\log(cx+1)}{c} + \frac{3b\sqrt{1-c^2x^2}}{c-c^2x} + \frac{3b\sqrt{1-c^2x^2}}{c^2x+c} \ldots}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^3,x]
```

```
[Out] -((2*b*Sqrt[1 - c^2*x^2])/(3*c*(-1 + c*x)^2) - (b*x*Sqrt[1 - c^2*x^2])/(3*(
-1 + c*x)^2) + (2*b*Sqrt[1 - c^2*x^2])/(3*c*(1 + c*x)^2) + (b*x*Sqrt[1 - c^
2*x^2])/(3*(1 + c*x)^2) + (3*b*Sqrt[1 - c^2*x^2])/(c - c^2*x) + (3*b*Sqrt[1
```

```
 - c^2*x^2])/(c + c^2*x) - (4*a*x)/(-1 + c^2*x^2)^2 + (6*a*x)/(-1 + c^2*x^2
) + ((3*I)*b*Pi*ArcSin[c*x])/c - (b*ArcSin[c*x])/(c*(-1 + c*x)^2) + (b*ArcS
in[c*x])/(c*(1 + c*x)^2) - (3*b*ArcSin[c*x])/(c - c^2*x) + (3*b*ArcSin[c*x]
)/(c + c^2*x) - (3*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c - (6*b*ArcSin[c*x]*
Log[1 - I*E^(I*ArcSin[c*x])])/c - (3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])])/c +
 (6*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c + (3*a*Log[1 - c*x])/c -
(3*a*Log[1 + c*x])/c + (3*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c + (3*b*
Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((6*I)*b*PolyLog[2, (-I)*E^(I*ArcS
in[c*x])])/c + ((6*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/c)/(16*d^3)
```

Maple [A] time = 0.145, size = 384, normalized size = 2.

$$\frac{a}{16\,cd^3\,(cx-1)^2}-\frac{3\,a}{16\,cd^3\,(cx-1)}-\frac{3\,a\ln(cx-1)}{16\,cd^3}-\frac{a}{16\,cd^3\,(cx+1)^2}-\frac{3\,a}{16\,cd^3\,(cx+1)}+\frac{3\,a\ln(cx+1)}{16\,cd^3}-\frac{3\,c^2b\arcsin(c}{8\,d^3\left(c^4x^4-2\,c^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16/c*a/d^3/(c*x-1)^2-3/16/c*a/d^3/(c*x-1)-3/16/c*a/d^3*ln(c*x-1)-1/16/c*a
/d^3/(c*x+1)^2-3/16/c*a/d^3/(c*x+1)+3/16/c*a/d^3*ln(c*x+1)-3/8*c^2*b/d^3/(c
^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x^3+3/8*c*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*(
-c^2*x^2+1)^(1/2)+5/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x-11/24/c*b/d
^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-3/8/c*b/d^3*arcsin(c*x)*ln(1+I*
(I*c*x+(-c^2*x^2+1)^(1/2)))+3/8/c*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))+3/8*I/c*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*I/c*b/d
^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{16}\,a\left(\frac{2\left(3\,c^2x^3-5\,x\right)}{c^4d^3x^4-2\,c^2d^3x^2+d^3}-\frac{3\,\log(cx+1)}{cd^3}+\frac{3\,\log(cx-1)}{cd^3}\right)+\frac{\left(3\left(c^4x^4-2\,c^2x^2+1\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a*(2*(3*c^2*x^3 - 5*x)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) - 3*log(c*
x + 1)/(c*d^3) + 3*log(c*x - 1)/(c*d^3)) + 1/16*(3*(c^4*x^4 - 2*c^2*x^2 + 1
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^4*x^4 - 2*
c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(
3*c^3*x^3 - 5*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^5*d^3
*x^4 - 2*c^3*d^3*x^2 + c*d^3)*integrate(-1/16*(6*c^3*x^3 - 10*c*x - 3*(c^4*
x^4 - 2*c^2*x^2 + 1)*log(c*x + 1) + 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log(-c*x +
1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x
^2 - d^3), x))*b/(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{b\arcsin(cx)+a}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2
- d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b \arcsin(cx) + a}{\left(c^2dx^2 - d\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d)^3, x)
```

3.51 $\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=173

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d^3}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d^3}+\frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2}-\frac{2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)(a}{d^3}$$

```
[Out] -(b*c*x)/(12*d^3*(1 - c^2*x^2)^(3/2)) - (2*b*c*x)/(3*d^3*Sqrt[1 - c^2*x^2])
 + (a + b*ArcSin[c*x])/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])/(2*d^3
*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^
3 + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((I/2)*b*PolyLog[2,
E^((2*I)*ArcSin[c*x])])/d^3
```

Rubi [A] time = 0.251842, antiderivative size = 173, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4705, 4679, 4419, 4183, 2279, 2391, 191, 192}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d^3}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d^3}+\frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2}-\frac{2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)(a}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^3),x]
```


```
[Out] -(b*c*x)/(12*d^3*(1 - c^2*x^2)^(3/2)) - (2*b*c*x)/(3*d^3*Sqrt[1 - c^2*x^2])
 + (a + b*ArcSin[c*x])/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])/(2*d^3
*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^
3 + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((I/2)*b*PolyLog[2,
E^((2*I)*ArcSin[c*x])])/d^3
```


Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
```

```
x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^3}\,dx = \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{1}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4d^3} + \frac{\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^2}\,dx}{d}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{6d^3} - \frac{(bc)\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}}{2d^3}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} + \frac{\text{Subst}\left(\int (a+bx)\,\text{csc}\right.}{}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} + \frac{2\,\text{Subst}\left(\int (a+bx)\,\text{cs}\right.}{}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\text{ta}}{d^3}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\text{ta}}{d^3}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\text{ta}}{d^3}$$

Mathematica [A] time = 0.936411, size = 201, normalized size = 1.16

$$-\frac{b\left(-6i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+6i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{8cx}{\sqrt{1-c^2x^2}}+\frac{cx}{\left(1-c^2x^2\right)^{3/2}}+\frac{6\sin^{-1}(cx)}{c^2x^2-1}-\frac{3\sin^{-1}(cx)}{\left(c^2x^2-1\right)^2}-12\sin^{-1}(cx\right.}{12d^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] -((-3*a)/(-1 + c^2*x^2)^2 + (6*a)/(-1 + c^2*x^2) - 12*a*Log[x] + 6*a*Log[1
- c^2*x^2] + b*((c*x)/(1 - c^2*x^2)^(3/2) + (8*c*x)/Sqrt[1 - c^2*x^2] - (3*
ArcSin[c*x])/(-1 + c^2*x^2)^2 + (6*ArcSin[c*x])/(-1 + c^2*x^2) - 12*ArcSin[
c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 12*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSi
n[c*x])] - (6*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + (6*I)*PolyLog[2, E^((
2*I)*ArcSin[c*x])]))/(12*d^3)
```

Maple [B] time = 0.199, size = 503, normalized size = 2.9

$$\frac{a}{16\,d^3\,(cx-1)^2} - \frac{5\,a}{16\,d^3\,(cx-1)} - \frac{a\ln(cx-1)}{2\,d^3} + \frac{a}{16\,d^3\,(cx+1)^2} + \frac{5\,a}{16\,d^3\,(cx+1)} - \frac{a\ln(cx+1)}{2\,d^3} + \frac{a\ln(cx)}{d^3} + \frac{\frac{4\,i}{3}bc}{d^3\left(c^4x^4-2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16*a/d^3/(c*x-1)^2-5/16*a/d^3/(c*x-1)-1/2*a/d^3*ln(c*x-1)+1/16*a/d^3/(c*x
+1)^2+5/16*a/d^3/(c*x+1)-1/2*a/d^3*ln(c*x+1)+a/d^3*ln(c*x)+4/3*I*b/d^3/(c^4
```

```
*x^4-2*c^2*x^2+1)*c^2*x^2+2/3*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3*(-c^2*x^2
+1)^(1/2)-1/2*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^2*x^2-2/3*I*b/d^3/(
c^4*x^4-2*c^2*x^2+1)*c^4*x^4-3/4*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c*x*(-c^2*x^2+
1)^(1/2)+3/4*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)+1/2*I*b*polylog(2,-(I*
c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+b/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))-2/3*I*b/d^3/(c^4*x^4-2*c^2*x^2+1)+b/d^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x
^2+1)^(1/2))-I*b/d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-b/d^3*arcsin(c*x)*
ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*b/d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1
/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a\left(\frac{2c^2x^2-3}{c^4d^3x^4-2c^2d^3x^2+d^3}+\frac{2\log(cx+1)}{d^3}+\frac{2\log(cx-1)}{d^3}-\frac{4\log(x)}{d^3}\right)-b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{c^6d^3x^7-3c^4d^3x^5+3c^2d^3x^3-d^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((2*c^2*x^2 - 3)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) + 2*log(c*x + 1
)/d^3 + 2*log(c*x - 1)/d^3 - 4*log(x)/d^3) - b*integrate(arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3
*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b\arcsin(cx)+a}{c^6d^3x^7-3c^4d^3x^5+3c^2d^3x^3-d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3
- d^3*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b\arcsin(cx)+a}{\left(c^2dx^2-d\right)^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x), x)
```

3.52 $\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=242

$$\frac{15ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8d^3}-\frac{15ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8d^3}+\frac{15c^2x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-$$

```
[Out] -(b*c)/(12*d^3*(1 - c^2*x^2)^(3/2)) - (7*b*c)/(8*d^3*Sqrt[1 - c^2*x^2]) - (
a + b*ArcSin[c*x])/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x]))/
(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*x^
2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^3 - (b
*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^3 + (((15*I)/8)*b*c*PolyLog[2, (-I)*E^(I*A
rcSin[c*x])])/d^3 - (((15*I)/8)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Rubi [A] time = 0.24238, antiderivative size = 242, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {4701, 4655, 4657, 4181, 2279, 2391, 261, 266, 51, 63, 208}

$$\frac{15ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8d^3}-\frac{15ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8d^3}+\frac{15c^2x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^3),x]
```


```
[Out] -(b*c)/(12*d^3*(1 - c^2*x^2)^(3/2)) - (7*b*c)/(8*d^3*Sqrt[1 - c^2*x^2]) - (
a + b*ArcSin[c*x])/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x]))/
(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*x^
2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^3 - (b
*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^3 + (((15*I)/8)*b*c*PolyLog[2, (-I)*E^(I*A
rcSin[c*x])])/d^3 - (((15*I)/8)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx = -\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\left(5c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}}\,dx}{d^3}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{(bc)\,\text{Subst}\left(\int \frac{1}{x\left(1-c^2x\right)^{5/2}}\,dx,x,x^2\right)}{2d^3}-\frac{\left(5bc^3\right)\int \ldots}{4d^3 \ldots}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{15c^2x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}+\ldots$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{15c^2x\left(a+\ldots\right.}{8d^3\left(1\ldots\right.}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{15c^2x\left(a+\ldots\right.}{8d^3\left(1\ldots\right.}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{15c^2x\left(a+\ldots\right.}{8d^3\left(1\ldots\right.}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{15c^2x\left(a+\ldots\right.}{8d^3\left(1\ldots\right.}$$

Mathematica [B] time = 1.51178, size = 512, normalized size = 2.12

$$-\frac{-30ibc\,\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+30ibc\,\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{14ac^2x}{c^2x^2-1}-\frac{4ac^2x}{\left(c^2x^2-1\right)^2}+15ac\log(1-cx)-15ac\log(cx\ldots}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -((16*a)/x + (2*b*c*Sqrt[1 - c^2*x^2])/(3*(-1 + c*x)^2) - (b*c^2*x*Sqrt[1 -
 c^2*x^2])/(3*(-1 + c*x)^2) - (7*b*c*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (2*b*c
*Sqrt[1 - c^2*x^2])/(3*(1 + c*x)^2) + (b*c^2*x*Sqrt[1 - c^2*x^2])/(3*(1 + c
*x)^2) + (7*b*c*Sqrt[1 - c^2*x^2])/(1 + c*x) - (4*a*c^2*x)/(-1 + c^2*x^2)^2
 + (14*a*c^2*x)/(-1 + c^2*x^2) + (15*I)*b*c*Pi*ArcSin[c*x] + (16*b*ArcSin[c
*x])/x - (b*c*ArcSin[c*x])/(-1 + c*x)^2 + (7*b*c*ArcSin[c*x])/(-1 + c*x) +
(b*c*ArcSin[c*x])/(1 + c*x)^2 + (7*b*c*ArcSin[c*x])/(1 + c*x) + 16*b*c*ArcT
anh[Sqrt[1 - c^2*x^2]] - 15*b*c*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 30*b*c*Ar
cSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 15*b*c*Pi*Log[1 + I*E^(I*ArcSin[c*
x])] + 30*b*c*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 15*a*c*Log[1 - c*x
] - 15*a*c*Log[1 + c*x] + 15*b*c*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 15*
b*c*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (30*I)*b*c*PolyLog[2, (-I)*E^(I*A
rcSin[c*x])] + (30*I)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/(16*d^3)
```

Maple [A] time = 0.223, size = 461, normalized size = 1.9

$$\frac{ca}{16\,d^{3}\,(cx-1)^{2}}-\frac{7\,ca}{16\,d^{3}\,(cx-1)}-\frac{15\,ca\ln(cx-1)}{16\,d^{3}}-\frac{ca}{16\,d^{3}\,(cx+1)^{2}}-\frac{7\,ca}{16\,d^{3}\,(cx+1)}+\frac{15\,ca\ln(cx+1)}{16\,d^{3}}-\frac{a}{d^{3}x}-\frac{15\,b\,\mathrm{arc}}{8\,d^{3}\,(c^{4}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16*c*a/d^3/(c*x-1)^2-7/16*c*a/d^3/(c*x-1)-15/16*c*a/d^3*ln(c*x-1)-1/16*c*
a/d^3/(c*x+1)^2-7/16*c*a/d^3/(c*x+1)+15/16*c*a/d^3*ln(c*x+1)-a/d^3/x-15/8*b
/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^4*x^3+7/8*b/d^3/(c^4*x^4-2*c^2*x^2
+1)*c^3*x^2*(-c^2*x^2+1)^(1/2)+25/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)
*c^2*x-23/24*c*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-b/d^3/(c^4*x^
4-2*c^2*x^2+1)/x*arcsin(c*x)+c*b/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-c*b/d^3
*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-15/8*c*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^
2*x^2+1)^(1/2)))+15/8*c*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)-15/8*I*c*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/8*I*c*b/d^3*dilog
(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{16}\,a\left(\frac{2\left(15\,c^{4}x^{4}-25\,c^{2}x^{2}+8\right)}{c^{4}d^{3}x^{5}-2\,c^{2}d^{3}x^{3}+d^{3}x}-\frac{15\,c\log(cx+1)}{d^{3}}+\frac{15\,c\log(cx-1)}{d^{3}}\right)+\frac{\left(15\left(c^{5}x^{5}-2\,c^{3}x^{3}+cx\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a*(2*(15*c^4*x^4 - 25*c^2*x^2 + 8)/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3
*x) - 15*c*log(c*x + 1)/d^3 + 15*c*log(c*x - 1)/d^3) + 1/16*(15*(c^5*x^5 -
2*c^3*x^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) -
15*(c^5*x^5 - 2*c^3*x^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*l
og(-c*x + 1) - 2*(15*c^4*x^4 - 25*c^2*x^2 + 8)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)) + 16*(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*x)*integrate(-1/16*(
30*c^5*x^4 - 50*c^3*x^2 - 15*(c^6*x^5 - 2*c^4*x^3 + c^2*x)*log(c*x + 1) + 1
5*(c^6*x^5 - 2*c^4*x^3 + c^2*x)*log(-c*x + 1) + 16*c)*sqrt(c*x + 1)*sqrt(-c
*x + 1)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x))*b/(c^4*d
^3*x^5 - 2*c^2*d^3*x^3 + d^3*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{b\arcsin(cx)+a}{c^{6}d^{3}x^{8}-3\,c^{4}d^{3}x^{6}+3\,c^{2}d^{3}x^{4}-d^{3}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c^2*d^3*x^4
- d^3*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b \arcsin(cx) + a}{\left(c^2dx^2 - d\right)^3 x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^2), x)
```

3.53 $\int \frac{a+b\sin^{-1}(cx)}{x^3(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=248

$$\frac{3ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d^3}-\frac{3ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d^3}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d^3\left(1-c^2x^2\right)}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b}{2d^3x^2(}$$

```
[Out] -(b*c)/(2*d^3*x*(1 - c^2*x^2)^(3/2)) + (5*b*c^3*x)/(12*d^3*(1 - c^2*x^2)^(3
/2)) - (2*b*c^3*x)/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a + b*ArcSin[c*x]))/
(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])/(2*d^3*x^2*(1 - c^2*x^2)^2) +
 (3*c^2*(a + b*ArcSin[c*x]))/(2*d^3*(1 - c^2*x^2)) - (6*c^2*(a + b*ArcSin[c
*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (((3*I)/2)*b*c^2*PolyLog[2, -E^(
(2*I)*ArcSin[c*x])])/d^3 - (((3*I)/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x]
)])/d^3
```

Rubi [A] time = 0.346334, antiderivative size = 248, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4701, 4705, 4679, 4419, 4183, 2279, 2391, 191, 192, 271}

$$\frac{3ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{2d^3}-\frac{3ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{2d^3}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d^3\left(1-c^2x^2\right)}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b}{2d^3x^2(}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^3),x]
```


```
[Out] -(b*c)/(2*d^3*x*(1 - c^2*x^2)^(3/2)) + (5*b*c^3*x)/(12*d^3*(1 - c^2*x^2)^(3
/2)) - (2*b*c^3*x)/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a + b*ArcSin[c*x]))/
(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])/(2*d^3*x^2*(1 - c^2*x^2)^2) +
 (3*c^2*(a + b*ArcSin[c*x]))/(2*d^3*(1 - c^2*x^2)) - (6*c^2*(a + b*ArcSin[c
*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (((3*I)/2)*b*c^2*PolyLog[2, -E^(
(2*I)*ArcSin[c*x])])/d^3 - (((3*I)/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x]
)])/d^3
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
```

```
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^3}\,dx=-\frac{a+b\sin^{-1}(cx)}{2d^3x^2\left(1-c^2x^2\right)^2}+\left(3c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}}\,dx}{2d^3}$$

$$=-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(cx)}{2d^3x^2\left(1-c^2x^2\right)^2}-\frac{\left(3bc^3\right)\int \frac{1}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4d^3}+\frac{\left(2bc^3\cdots\right.}{\cdots}$$

$$=-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(cx)}{2d^3x^2\left(1-c^2x^2\right)^2}+\frac{3c^2\left(a+\cdots\right.}{2d^3\left(1\cdots\right.}$$

$$=-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(\cdots}{2d^3x^2\left(1-c^2\cdots\right.}$$

$$=-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(\cdots}{2d^3x^2\left(1-c^2\cdots\right.}$$

$$=-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(\cdots}{2d^3x^2\left(1-c^2\cdots\right.}$$

$$=-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(\cdots}{2d^3x^2\left(1-c^2\cdots\right.}$$

$$=-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(\cdots}{2d^3x^2\left(1-c^2\cdots\right.}$$

Mathematica [A] time = 1.47888, size = 256, normalized size = 1.03

$$-\frac{bc^2\left(-18i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+18i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{14cx}{\sqrt{1-c^2x^2}}+\frac{cx}{\left(1-c^2x^2\right)^{3/2}}+\frac{6\sqrt{1-c^2x^2}}{cx}+\frac{12\sin^{-1}(cx)}{c^2x^2-1}-\frac{3\sin^{-1}(\cdots}{\left(c^2x^2-1\cdots\right.}\cdots\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] -((6*a)/x^2 - (3*a*c^2)/(-1 + c^2*x^2)^2 + (12*a*c^2)/(-1 + c^2*x^2) - 36*a
*c^2*Log[x] + 18*a*c^2*Log[1 - c^2*x^2] + b*c^2*((c*x)/(1 - c^2*x^2)^(3/2)
+ (14*c*x)/Sqrt[1 - c^2*x^2] + (6*Sqrt[1 - c^2*x^2])/(c*x) + (6*ArcSin[c*x]
)/(c^2*x^2) - (3*ArcSin[c*x])/(-1 + c^2*x^2)^2 + (12*ArcSin[c*x])/(-1 + c^2
*x^2) - 36*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 36*ArcSin[c*x]*Log[
1 + E^((2*I)*ArcSin[c*x])] - (18*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + (1
8*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(12*d^3)
```

Maple [B] time = 0.264, size = 635, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16*c^2*a/d^3/(c*x-1)^2-9/16*c^2*a/d^3/(c*x-1)-3/2*c^2*a/d^3*ln(c*x-1)+1/1
6*c^2*a/d^3/(c*x+1)^2+9/16*c^2*a/d^3/(c*x+1)-3/2*c^2*a/d^3*ln(c*x+1)-1/2*a/
d^3/x^2+3*c^2*a/d^3*ln(c*x)+4/3*I*c^4*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2+2/3*c
^5*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^3*(-c^2*x^2+1)^(1/2)-3/2*c^4*b/d^3/(c^4*x^
4-2*c^2*x^2+1)*arcsin(c*x)*x^2-2/3*I*c^2*b/d^3/(c^4*x^4-2*c^2*x^2+1)-1/4*c^
3*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x*(-c^2*x^2+1)^(1/2)+9/4*c^2*b/d^3/(c^4*x^4-2
*c^2*x^2+1)*arcsin(c*x)-3*I*c^2*b/d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1
/2*c*b/d^3/(c^4*x^4-2*c^2*x^2+1)/x*(-c^2*x^2+1)^(1/2)-1/2*b/d^3/(c^4*x^4-2*
c^2*x^2+1)/x^2*arcsin(c*x)+3*c^2*b/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))-3*I*c^2*b/d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+3*c^2*b/d^3*arcsi
n(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+3/2*I*b*c^2*polylog(2,-(I*c*x+(-c^2*x
^2+1)^(1/2))^2)/d^3-3*c^2*b/d^3*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))
^2)-2/3*I*c^6*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a\left(\frac{6c^4x^4-9c^2x^2+2}{c^4d^3x^6-2c^2d^3x^4+d^3x^2}+\frac{6c^2\log(cx+1)}{d^3}+\frac{6c^2\log(cx-1)}{d^3}-\frac{12c^2\log(x)}{d^3}\right)-b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-}\right.}{c^6d^3x^9-3c^4d^3x^7+3c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*c^4*x^4 - 9*c^2*x^2 + 2)/(c^4*d^3*x^6 - 2*c^2*d^3*x^4 + d^3*x^2)
 + 6*c^2*log(c*x + 1)/d^3 + 6*c^2*log(c*x - 1)/d^3 - 12*c^2*log(x)/d^3) - b
*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^9 - 3*c^4*
d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b\arcsin(cx)+a}{c^6d^3x^9-3c^4d^3x^7+3c^2d^3x^5-d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5
- d^3*x^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b \arcsin{(cx)} + a}{\left(c^2dx^2 - d\right)^3 x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^3), x)
```

3.54 $\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=317

$$\frac{35ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8d^3}-\frac{35ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8d^3}+\frac{35c^4x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}+\frac{35c^4x\left(a+b\sin^{-1}(cx)\right)}{12d^3\left(1-c^2x^2\right)^2}$$

```
[Out] (b*c^3)/(12*d^3*(1 - c^2*x^2)^(3/2)) - (b*c)/(6*d^3*x^2*(1 - c^2*x^2)^(3/2)
) - (29*b*c^3)/(24*d^3*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(3*d^3*x^3*
(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x]))/(3*d^3*x*(1 - c^2*x^2)^2) +
(35*c^4*x*(a + b*ArcSin[c*x]))/(12*d^3*(1 - c^2*x^2)^2) + (35*c^4*x*(a + b*
ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b*ArcSin[c*x])*A
rcTan[E^(I*ArcSin[c*x])])/d^3 - (19*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d^
3) + (((35*I)/8)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - (((35*I)/8
)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Rubi [A] time = 0.381699, antiderivative size = 369, normalized size of antiderivative = 1.16, number of steps used = 23, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {4701, 4655, 4657, 4181, 2279, 2391, 261, 266, 51, 63, 208}

$$\frac{35ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{8d^3}-\frac{35ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{8d^3}+\frac{35c^4x\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}+\frac{35c^4x\left(a+b\sin^{-1}(cx)\right)}{12d^3\left(1-c^2x^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] (-7*b*c^3)/(36*d^3*(1 - c^2*x^2)^(3/2)) + (b*c)/(9*d^3*x^2*(1 - c^2*x^2)^(3
/2)) - (49*b*c^3)/(24*d^3*Sqrt[1 - c^2*x^2]) + (5*b*c)/(9*d^3*x^2*Sqrt[1 -
c^2*x^2]) - (5*b*c*Sqrt[1 - c^2*x^2])/(6*d^3*x^2) - (a + b*ArcSin[c*x])/(3*
d^3*x^3*(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x]))/(3*d^3*x*(1 - c^2*x^
2)^2) + (35*c^4*x*(a + b*ArcSin[c*x]))/(12*d^3*(1 - c^2*x^2)^2) + (35*c^4*x
*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b*ArcSin
[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^3 - (19*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]
])/(6*d^3) + (((35*I)/8)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - ((
(35*I)/8)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
```

```
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx = -\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(7c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int \frac{1}{x^3\left(1-c^2x^2\right)^{5/2}}\,dx}{3d^3}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2\left(a+b\sin^{-1}(cx)\right)}{3d^3x\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(35c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\,\mathrm{Subst}\left(\int\right.}{}$$

$$= \frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2\left(a+b\sin^{-1}(cx)\right)}{3d^3x\left(1-c^2x^2\right)^2}+\frac{35c^4x\left(a+b\sin^{-1}(cx)\right)}{12d^3\left(1-c^2x^2\right)^2}+$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2\left(a+b\right.}{3d^3x\left(1\right.}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}-\frac{5bc\sqrt{1-c^2x}}{6d^3x^2}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}-\frac{5bc\sqrt{1-c^2x}}{6d^3x^2}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}-\frac{5bc\sqrt{1-c^2x}}{6d^3x^2}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}-\frac{5bc\sqrt{1-c^2x}}{6d^3x^2}$$

Mathematica [A] time = 1.52046, size = 587, normalized size = 1.85

$$-\frac{-210ibc^3\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+210ibc^3\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{66ac^4x}{c^2x^2-1}-\frac{12ac^4x}{\left(c^2x^2-1\right)^2}+\frac{144ac^2}{x}+105ac^3\log(1-cx}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -((16*a)/x^3 + (144*a*c^2)/x + (8*b*c*Sqrt[1 - c^2*x^2])/x^2 + (2*b*c^3*Sqr
t[1 - c^2*x^2])/(-1 + c*x)^2 - (b*c^4*x*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 - (
33*b*c^3*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (2*b*c^3*Sqrt[1 - c^2*x^2])/(1 + c
*x)^2 + (b*c^4*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (33*b*c^3*Sqrt[1 - c^2*x^
2])/(1 + c*x) - (12*a*c^4*x)/(-1 + c^2*x^2)^2 + (66*a*c^4*x)/(-1 + c^2*x^2)
 + (105*I)*b*c^3*Pi*ArcSin[c*x] + (16*b*ArcSin[c*x])/x^3 + (144*b*c^2*ArcSi
n[c*x])/x - (3*b*c^3*ArcSin[c*x])/(-1 + c*x)^2 + (33*b*c^3*ArcSin[c*x])/(-1
 + c*x) + (3*b*c^3*ArcSin[c*x])/(1 + c*x)^2 + (33*b*c^3*ArcSin[c*x])/(1 + c
```

```
*x) + 152*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 105*b*c^3*Pi*Log[1 - I*E^(I*Ar
cSin[c*x])] - 210*b*c^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 105*b*c^
3*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 210*b*c^3*ArcSin[c*x]*Log[1 + I*E^(I*Ar
cSin[c*x])] + 105*a*c^3*Log[1 - c*x] - 105*a*c^3*Log[1 + c*x] + 105*b*c^3*P
i*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 105*b*c^3*Pi*Log[Sin[(Pi + 2*ArcSin[c
*x])/4]] - (210*I)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (210*I)*b*c^3
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(48*d^3)
```

Maple [A] time = 0.304, size = 576, normalized size = 1.8

$$\frac{c^3 a}{16 d^3 (cx-1)^2} - \frac{11 c^3 a}{16 d^3 (cx-1)} - \frac{35 c^3 a \ln(cx-1)}{16 d^3} - \frac{c^3 a}{16 d^3 (cx+1)^2} - \frac{11 c^3 a}{16 d^3 (cx+1)} + \frac{35 c^3 a \ln(cx+1)}{16 d^3} - \frac{a}{3 d^3 x^3} - 3 \frac{c^2}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16*c^3*a/d^3/(c*x-1)^2-11/16*c^3*a/d^3/(c*x-1)-35/16*c^3*a/d^3*ln(c*x-1)-
1/16*c^3*a/d^3/(c*x+1)^2-11/16*c^3*a/d^3/(c*x+1)+35/16*c^3*a/d^3*ln(c*x+1)-
1/3*a/d^3/x^3-3*c^2*a/d^3/x-35/8*c^6*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x
)*x^3+29/24*c^5*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*(-c^2*x^2+1)^(1/2)+175/24*c
^4*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x-9/8*c^3*b/d^3/(c^4*x^4-2*c^2*x
^2+1)*(-c^2*x^2+1)^(1/2)-7/3*c^2*b/d^3/(c^4*x^4-2*c^2*x^2+1)/x*arcsin(c*x)-
1/6*c*b/d^3/(c^4*x^4-2*c^2*x^2+1)/x^2*(-c^2*x^2+1)^(1/2)-1/3*b/d^3/(c^4*x^4
-2*c^2*x^2+1)/x^3*arcsin(c*x)+19/6*c^3*b/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)
-19/6*c^3*b/d^3*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+35/8*I*c^3*b/d^3*dilog(1+I*(
I*c*x+(-c^2*x^2+1)^(1/2)))-35/8*I*c^3*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))-35/8*c^3*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/8*c
^3*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{48} a \left(\frac{105 c^3 \log(cx+1)}{d^3} - \frac{105 c^3 \log(cx-1)}{d^3} - \frac{2 \left(105 c^6 x^6 - 175 c^4 x^4 + 56 c^2 x^2 + 8\right)}{c^4 d^3 x^7 - 2 c^2 d^3 x^5 + d^3 x^3} \right) + \frac{\left(105 \left(c^7 x^7 - 2 c^5 x^5 + c^3 x^3\right) \operatorname{arct}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/48*a*(105*c^3*log(c*x + 1)/d^3 - 105*c^3*log(c*x - 1)/d^3 - 2*(105*c^6*x^
6 - 175*c^4*x^4 + 56*c^2*x^2 + 8)/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*x^3))
+ 1/48*(105*(c^7*x^7 - 2*c^5*x^5 + c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(c*x + 1) - 105*(c^7*x^7 - 2*c^5*x^5 + c^3*x^3)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(105*c^6*x^6 - 175*c^4*x^4
 + 56*c^2*x^2 + 8)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 48*(c^4*d^3
*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)*integrate(-1/48*(210*c^7*x^6 - 350*c^5*x^4
+ 112*c^3*x^2 - 105*(c^8*x^7 - 2*c^6*x^5 + c^4*x^3)*log(c*x + 1) + 105*(c^8
*x^7 - 2*c^6*x^5 + c^4*x^3)*log(-c*x + 1) + 16*c)*sqrt(c*x + 1)*sqrt(-c*x +
 1)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x))*b/(c^4*d^3
*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b \arcsin\left(cx\right) + a}{c^{6} d^{3} x^{10} - 3\, c^{4} d^{3} x^{8} + 3\, c^{2} d^{3} x^{6} - d^{3} x^{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^10 - 3*c^4*d^3*x^8 + 3*c^2*d^3*x^6
 - d^3*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b \arcsin\left(cx\right) + a}{{\left(c^{2} d x^{2} - d\right)}^{3} x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^4), x)
```

3.55 $\int x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=262

$$\frac{1}{6}x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{24c^2}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{16c^4}+\frac{\sqrt{d-c^2dx^2}\left(a+b\right.}{32bc^5\sqrt{1-}}$$

```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(32*c^3*Sqrt[1 - c^2*x^2]) + (b*x^4*Sqrt[d - c^
2*d*x^2])/(96*c*Sqrt[1 - c^2*x^2]) - (b*c*x^6*Sqrt[d - c^2*d*x^2])/(36*Sqrt
[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*c^4) - (x^
3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(24*c^2) + (x^5*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/6 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3
2*b*c^5*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.28189, antiderivative size = 262, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4697, 4707, 4641, 30}

$$\frac{1}{6}x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{24c^2}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{16c^4}+\frac{\sqrt{d-c^2dx^2}\left(a+b\right.}{32bc^5\sqrt{1-}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(32*c^3*Sqrt[1 - c^2*x^2]) + (b*x^4*Sqrt[d - c^
2*d*x^2])/(96*c*Sqrt[1 - c^2*x^2]) - (b*c*x^6*Sqrt[d - c^2*d*x^2])/(36*Sqrt
[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*c^4) - (x^
3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(24*c^2) + (x^5*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/6 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3
2*b*c^5*Sqrt[1 - c^2*x^2])
```


Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
```

```
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx = \frac{1}{6}x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\int\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}dx}{6\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-\right.}{6\cdots}$$

$$= -\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{24c^2}+\frac{1}{6}x^5\sqrt{d-c^2dx^2}\left(a+b\,\mathrm{s}\cdots\right.$$

$$= \frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}}-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{16c^4}-\frac{x^3\sqrt{d-\cdots}}{\cdots}$$

$$= \frac{bx^2\sqrt{d-c^2dx^2}}{32c^3\sqrt{1-c^2x^2}}+\frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}}-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin\cdots\right.}{16c^4}$$

Mathematica [A] time = 0.124203, size = 169, normalized size = 0.65

$$\frac{\sqrt{d-c^2dx^2}\left(9a^2+6abcx\sqrt{1-c^2x^2}\left(8c^4x^4-2c^2x^2-3\right)+6b\sin^{-1}(cx)\left(3a+bcx\sqrt{1-c^2x^2}\left(8c^4x^4-2c^2x^2-3\right)\right)+b^2c^2\cdots\right.}{288bc^5\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(9*a^2 + b^2*c^2*x^2*(9 + 3*c^2*x^2 - 8*c^4*x^4) + 6*a
*b*c*x*Sqrt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 8*c^4*x^4) + 6*b*(3*a + b*c*x*Sq
rt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + 9*b^2*ArcSin[c*
x]^2))/(288*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.448, size = 482, normalized size = 1.8

$$-\frac{ax^3}{6c^2d}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-\frac{ax}{8c^4d}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{ax}{16c^4}\sqrt{-c^2dx^2+d}+\frac{ad}{16c^4}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}+\frac{b\cdots}{36c^{\cdots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/6*a*x^3*(-c^2*d*x^2+d)^(3/2)/c^2/d-1/8*a/c^4*x*(-c^2*d*x^2+d)^(3/2)/d+1/
16*a/c^4*x*(-c^2*d*x^2+d)^(1/2)+1/16*a/c^4*d/(c^2*d)^(1/2)*arctan((c^2*d)^(
1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/36*b*(-d*(c^2*x^2-1))^(1/2)*c/(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)*x^6-1/96*b*(-d*(c^2*x^2-1))^(1/2)/c/(c^2*x^2-1)*(-c^2*x^2+
1)^(1/2)*x^4-1/32*b*(-d*(c^2*x^2-1))^(1/2)/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*x^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)*c^2/(c^2*x^2-1)*arcsin(c*x)*x^7-5/24*b*
(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x^5-1/48*b*(-d*(c^2*x^2-1))^
```

```
(1/2)/c^2/(c^2*x^2-1)*arcsin(c*x)*x^3+1/16*b*(-d*(c^2*x^2-1))^(1/2)/c^4/(c^
2*x^2-1)*arcsin(c*x)*x+25/2304*b*(-d*(c^2*x^2-1))^(1/2)/c^5/(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)-1/32*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/(c^2*x
^2-1)*arcsin(c*x)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^4 \arcsin(cx) + ax^4\right)\sqrt{-c^2dx^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^4, x)
```

3.56 $\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=189

$$\frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc^3\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(16*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d - c^
2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 + (Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.191156, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4697, 4707, 4641, 30}

$$\frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc^3\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(16*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d - c^
2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 + (Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^3*Sqrt[1 - c^2*x^2])
```


Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\int\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}dx}{4\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-c^2d\right.}{4\sqrt{1-}}$$

$$=-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.$$

$$=\frac{bx^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{1}{4}x^3\sqrt{d-c^2}$$

Mathematica [A] time = 0.0956823, size = 140, normalized size = 0.74

$$\frac{\sqrt{d-c^2dx^2}\left(a^2+2abcx\sqrt{1-c^2x^2}\left(2c^2x^2-1\right)+2b\sin^{-1}(cx)\left(a+bcx\sqrt{1-c^2x^2}\left(2c^2x^2-1\right)\right)+b^2c^2x^2\left(1-c^2x^2\right)+b^2\sin^{-}\right.}{16bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a^2 + b^2*c^2*x^2*(1 - c^2*x^2) + 2*a*b*c*x*Sqrt[1 -
c^2*x^2]*(-1 + 2*c^2*x^2) + 2*b*(a + b*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^
2))*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.206, size = 373, normalized size = 2.

$$-\frac{ax}{4c^2d}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{ax}{8c^2}\sqrt{-c^2dx^2+d}+\frac{ad}{8c^2}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}+\frac{bcx^4}{16c^2x^2-16}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/4*a*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/8*a/c^2*x*(-c^2*d*x^2+d)^(1/2)+1/8*a/
c^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/16*b*(-d
*(c^2*x^2-1))^(1/2)*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-1/16*b*(-d*(c^2*x^
2-1))^(1/2)/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+1/4*b*(-d*(c^2*x^2-1))^(1/
2)*c^2/(c^2*x^2-1)*arcsin(c*x)*x^5-3/8*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)
*arcsin(c*x)*x^3+1/8*b*(-d*(c^2*x^2-1))^(1/2)/c^2/(c^2*x^2-1)*arcsin(c*x)*x
+1/128*b*(-d*(c^2*x^2-1))^(1/2)/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-1/16*b*(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2dx^2+d}\left(bx^2\arcsin\left(cx\right)+ax^2\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\,\text{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{-c^2dx^2+d}(b\arcsin\left(cx\right)+a)x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^2, x)
```

3.57 $\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=116

$$\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}$$

```
[Out] -(b*c*x^2*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*
b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.0548086, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4647, 4641, 30}

$$\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(b*c*x^2*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*
b*c*Sqrt[1 - c^2*x^2])
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int}{2\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right.}{4bc\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.0504091, size = 111, normalized size = 0.96

$$\frac{\sqrt{d-c^2dx^2}\left(a^2+2abcx\sqrt{1-c^2x^2}+2b\sin^{-1}(cx)\left(a+bcx\sqrt{1-c^2x^2}\right)-b^2c^2x^2+b^2\sin^{-1}(cx)^2\right)}{4bc\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a^2 - b^2*c^2*x^2 + 2*a*b*c*x*Sqrt[1 - c^2*x^2] + 2*b
*(a + b*c*x*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(4*b*c*Sqr
t[1 - c^2*x^2])
```

Maple [B] time = 0.112, size = 260, normalized size = 2.2

$$\frac{ax}{2}\sqrt{-c^2dx^2+d}+\frac{ad}{2}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{b\left(\arcsin(cx)\right)^2}{4c\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}+\frac{bc^2\arcsin(}{2c^2x^2-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/2*a*x*(-c^2*d*x^2+d)^(1/2)+1/2*a*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(
-c^2*d*x^2+d)^(1/2))-1/4*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2
*x^2-1)*arcsin(c*x)^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)*c^2/(c^2*x^2-1)*arcsin(c
*x)*x^3+1/4*b*(-d*(c^2*x^2-1))^(1/2)*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2-1
/2*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x-1/8*b*(-d*(c^2*x^2-1)
)^(1/2)/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\,\mathrm{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2+d}\left(b\arcsin\left(cx\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a), x)
```

3.58 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=110

$$-\frac{c\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2b\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x) - (c*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[
x])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.110228, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4693, 29, 4641}

$$-\frac{c\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2b\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x) - (c*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[
x])/Sqrt[1 - c^2*x^2]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx &= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{1}{x}\,dx}{\sqrt{1-c^2x^2}}-\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int \frac{a+}{}}{\sqrt{1-c^2x^2}}\\ &= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{c\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2b\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx}}{\sqrt{1-c^2}}\end{aligned}$$

Mathematica [A] time = 0.328402, size = 142, normalized size = 1.29

$$-\frac{a\sqrt{-d\left(c^2x^2-1\right)}}{x}+ac\sqrt{d}\tan^{-1}\left(\frac{cx\sqrt{-d\left(c^2x^2-1\right)}}{\sqrt{d}\left(c^2x^2-1\right)}\right)-\frac{bc\sqrt{d\left(1-c^2x^2\right)}\left(\frac{2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{cx}-2\log(cx)+\sin^{-1}(cx)^2\right)}{2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*Sqrt[-(d*(-1 + c^2*x^2))])/x) + a*c*Sqrt[d]*ArcTan[(c*x*Sqrt[-(d*(-1 +
 c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))] - (b*c*Sqrt[d*(1 - c^2*x^2)]*((2*Sqr
t[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]^2 - 2*Log[c*x]))/(2*Sqrt[1
- c^2*x^2])
```

Maple [C] time = 0.172, size = 308, normalized size = 2.8

$$-\frac{a}{dx}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-ac^2x\sqrt{-c^2dx^2+d}-ac^2d\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}+\frac{b\left(\arcsin\left(cx\right)\right)^2c}{2c^2x^2-2}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(3/2)-a*c^2*x*(-c^2*d*x^2+d)^(1/2)-a*c^2*d/(c^2*d)^(1
/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/2*b*(-d*(c^2*x^2-1))^(1/
2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c+I*b*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c-b*(-d*(c^2*x^2-1))^(1/2)*arc
sin(c*x)/(c^2*x^2-1)*x*c^2+b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)
/x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*
x^2+1)^(1/2))^2-1)*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin\left(cx\right)+a)}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-d(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^2, x)
```

3.59 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=111

$$-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}-\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{bc^3\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(6*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/
2)*(a + b*ArcSin[c*x]))/(3*d*x^3) - (b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*S
qrt[1 - c^2*x^2])
```

Rubi [A] time = 0.0925604, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {4681, 14}

$$-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}-\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{bc^3\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^4,x]
```


```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(6*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/
2)*(a + b*ArcSin[c*x]))/(3*d*x^3) - (b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*S
qrt[1 - c^2*x^2])
```


Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx &= -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{1-c^2x^2}{x^3}\,dx}{3\sqrt{1-c^2x^2}}\\
&= -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \left(\frac{1}{x^3}-\frac{c^2}{x}\right)dx}{3\sqrt{1-c^2x^2}}\\
&= -\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}-\frac{bc^3\sqrt{d-c^2dx^2}\log(x)}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] time = 0.133413, size = 134, normalized size = 1.21

$$\frac{\sqrt{d-c^2dx^2}\left(2a\left(c^2x^2-1\right)^2+bcx\left(1-3c^2x^2\right)\sqrt{1-c^2x^2}+2b\left(c^2x^2-1\right)^2\sin^{-1}(cx)\right)}{6x^3\left(c^2x^2-1\right)}-\frac{bc^3\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(b*c*x*(1 - 3*c^2*x^2)*Sqrt[1 - c^2*x^2] + 2*a*(-1 + c
^2*x^2)^2 + 2*b*(-1 + c^2*x^2)^2*ArcSin[c*x]))/(6*x^3*(-1 + c^2*x^2)) - (b*
c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.243, size = 1117, normalized size = 10.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(3/2)-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4
-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8-I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c
^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5+b*(-d*(c^2*x^2
-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-1/6*I*b*
(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*c^4-2*I*b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3/(3*c^2*x^2-3)+1/3*I*b
*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1
/2)*arcsin(c*x)*c^3-3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/
(c^2*x^2-1)*arcsin(c*x)*c^6+I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2
+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^7+1/6*I*b*(-d*(c^2*x^2
-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4+1/2*b*(-d
*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1
/2)*c^5+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2
-1)*c^6+10/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)
*arcsin(c*x)*c^4-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3
/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-1/2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2
*x^2+1)/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-5/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*
c^4*x^4-3*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^2+1/6*b*(-d*(c^2*x^2-1))^(
1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/3*b*(-d
*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+1/3
*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^
2+1)^(1/2))^2-1)*c^3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 2.60023, size = 883, normalized size = 7.95

$$\left[\frac{\left(bc^5x^5 - bc^3x^3\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) - \sqrt{-c^2dx^2+d}\left(bcx^3 - bcx\right)\sqrt{-c^2x^2+1} + 2\left(ac^4x^4 - \right.}{6\left(c^2x^5 - x^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] [1/6*((b*c^5*x^5 - b*c^3*x^3)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4 +
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 - x
^2)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*x^2 + 1) + 2*(a*c^4
*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsin(c*x) + a)*sqrt(-c
^2*d*x^2 + d))/(c^2*x^5 - x^3), -1/6*(2*(b*c^5*x^5 - b*c^3*x^3)*sqrt(-d)*ar
ctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4
- (c^2 + 1)*d*x^2 + d)) + sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*
x^2 + 1) - 2*(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsi
n(c*x) + a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^5 - x^3)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^4, x)
```

3.60 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^6}\,dx$

Optimal. Leaf size=187

$$-\frac{2c^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15dx^3}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5}+\frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}-\frac{2bc^5\log}{15}$$

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(20*x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c^2
*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[
c*x]))/(5*d*x^5) - (2*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(15*d*
x^3) - (2*b*c^5*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.134158, antiderivative size = 187, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {271, 264, 4691, 12, 14}

$$-\frac{2c^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15dx^3}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5}+\frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}-\frac{2bc^5\log}{15}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(20*x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c^2
*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[
c*x]))/(5*d*x^5) - (2*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(15*d*
x^3) - (2*b*c^5*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^6}\,dx = -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-3+c^2x^2+2c^4x^4}{15x^5}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int \frac{\sqrt{d-c^2dx^2}}{x^6}\,dx$$

$$= -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-3+c^2x^2+2c^4x^4}{x^5}\,dx}{15\sqrt{1-c^2x^2}} + \frac{1}{5}\left(2c^2\left(a+\right.\right.$$

$$= -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5} - \frac{2c^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15dx^3} - \left(bc\sqrt{d-\right.$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5} - 2c^2\left(d-c^2d\right.$$

Mathematica [A] time = 0.137784, size = 162, normalized size = 0.87

$$\frac{\sqrt{d-c^2dx^2}\left(12a\left(2c^2x^2+3\right)\left(c^2x^2-1\right)^2+bcx\sqrt{1-c^2x^2}\left(-50c^4x^4-6c^2x^2+9\right)+12b\left(2c^2x^2+3\right)\left(c^2x^2-1\right)^2\sin^{-1}(cx)\right)}{180x^5\left(c^2x^2-1\right)} -$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(12*a*(-1 + c^2*x^2)^2*(3 + 2*c^2*x^2) + b*c*x*Sqrt[1
- c^2*x^2]*(9 - 6*c^2*x^2 - 50*c^4*x^4) + 12*b*(-1 + c^2*x^2)^2*(3 + 2*c^2*
x^2)*ArcSin[c*x]))/(180*x^5*(-1 + c^2*x^2)) - (2*b*c^5*Sqrt[d - c^2*d*x^2]*
Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.302, size = 1902, normalized size = 10.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x)
```

```
[Out] -2/15*a*c^2/d/x^3*(-c^2*d*x^2+d)^(3/2)+2/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*
c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12+3/10*I*b*
(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*(-
c^2*x^2+1)*c^6-2/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2
*x^2+9)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^10-3/10*I*b*(-d*(c^2*x^2-1))^(1/2)/(
15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^8+6/5*I*b
*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/(c^2*x^2-1)*arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+9/20*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5
*c^4*x^4-15*c^2*x^2+9)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-4*I*b*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5/(15*c^2*x^2-15)+2/15*I*b*(
```

```
-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^9/(c^2*x^2-1)*c
^14-4/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^7
/(c^2*x^2-1)*c^12-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c
^2*x^2+9)*x^5/(c^2*x^2-1)*c^10+3/5*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5
*c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)*c^8-3/10*I*b*(-d*(c^2*x^2-1))^(1/2)/
(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*c^6+2*b*(-d*(c^2*x^2-1))^
(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^12-
5/3*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^5/(c^2*x
^2-1)*arcsin(c*x)*c^10-1/2*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-1
5*c^2*x^2+9)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9-17/3*b*(-d*(c^2*x^2-1))
^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^8+
11/12*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^2/(c^2
*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)+98/15*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5
*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*arcsin(c*x)*c^6+12/5*b*(-d*(c^2*x^2-1)
)^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/x/(c^2*x^2-1)*arcsin(c*x)*c^4-2
1/20*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/x^2/(c^2*
x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-27/5*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c
^4*x^4-15*c^2*x^2+9)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^2+9/5*b*(-d*(c^2*x^2-1))
^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/x^5/(c^2*x^2-1)*arcsin(c*x)+2/15
*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^
2+1)^(1/2))^2-1)*c^5+1/4*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*
c^2*x^2+9)/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)-1/5*a/d/x^5*(-c^2*d*x^2+d)^(3
/2)+2*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^6/(c
^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^11-2/3*I*b*(-d*(c^2*x^2-1))^(1/2
)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)*c^9-2*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2
+9)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.71307, size = 1056, normalized size = 5.65

$$\left[\frac{4\left(bc^7x^7 - bc^5x^5\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) - \left(2\,bc^3x^3 - \left(2\,bc^3 - 3\,bc\right)x^5 - 3\,bcx\right)\sqrt{-c^2dx^2 +}}{60\left(c^2x^7 -\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [1/60*(4*(b*c^7*x^7 - b*c^5*x^5)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4
 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4
- x^2)) - (2*b*c^3*x^3 - (2*b*c^3 - 3*b*c)*x^5 - 3*b*c*x)*sqrt(-c^2*d*x^2 +
 d)*sqrt(-c^2*x^2 + 1) + 4*(2*a*c^6*x^6 - a*c^4*x^4 - 4*a*c^2*x^2 + (2*b*c^
6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2 + 3*b)*arcsin(c*x) + 3*a)*sqrt(-c^2*d*x^2 +
 d))/(c^2*x^7 - x^5), -1/60*(8*(b*c^7*x^7 - b*c^5*x^5)*sqrt(-d)*arctan(sqrt
```

```
(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 +
1)*d*x^2 + d)) + (2*b*c^3*x^3 - (2*b*c^3 - 3*b*c)*x^5 - 3*b*c*x)*sqrt(-c^2*
d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(2*a*c^6*x^6 - a*c^4*x^4 - 4*a*c^2*x^2 +
(2*b*c^6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2 + 3*b)*arcsin(c*x) + 3*a)*sqrt(-c^2*
d*x^2 + d))/(c^2*x^7 - x^5)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\operatorname{asin}(cx))}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**6, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^6, x)
```

3.61 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^8}\,dx$

Optimal. Leaf size=263

$$-\frac{8c^4\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{105dx^3}-\frac{4c^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{35dx^5}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}+\frac{2bc^5\sqrt{}}{105x^2}$$

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(42*x^6*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c^2
*d*x^2])/(140*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^5*Sqrt[d - c^2*d*x^2])/(105*x
^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(7*d*x^
7) - (4*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) - (8*c^4*
(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*d*x^3) - (8*b*c^7*Sqrt[d -
c^2*d*x^2]*Log[x])/(105*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.168816, antiderivative size = 263, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {271, 264, 4691, 12, 14}

$$-\frac{8c^4\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{105dx^3}-\frac{4c^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{35dx^5}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}+\frac{2bc^5\sqrt{}}{105x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^8,x]
```


```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(42*x^6*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c^2
*d*x^2])/(140*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^5*Sqrt[d - c^2*d*x^2])/(105*x
^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(7*d*x^
7) - (4*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) - (8*c^4*
(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*d*x^3) - (8*b*c^7*Sqrt[d -
c^2*d*x^2]*Log[x])/(105*Sqrt[1 - c^2*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^8}\,dx = -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-15+3c^2x^2+4c^4x^4+8c^6x^6}{105x^7}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int \frac{\sqrt{d-c^2dx^2}}{x^8}\,dx$$

$$= -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-15+3c^2x^2+4c^4x^4+8c^6x^6}{x^7}\,dx}{105\sqrt{1-c^2x^2}} + \frac{1}{7}(\ldots$$

$$= -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7} - \frac{4c^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{35dx^5} - \frac{\left(bc\sqrt{d-\ldots\right.}{\ldots}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{140x^4\sqrt{1-c^2x^2}} + \frac{2bc^5\sqrt{d-c^2dx^2}}{105x^2\sqrt{1-c^2x^2}} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}\ldots\right.}{7dx^7}$$

Mathematica [A] time = 0.158904, size = 187, normalized size = 0.71

$$\frac{\sqrt{d-c^2dx^2}\left(20a\left(8c^4x^4+12c^2x^2+15\right)\left(c^2x^2-1\right)^2 - bcx\sqrt{1-c^2x^2}\left(392c^6x^6+40c^4x^4+15c^2x^2-50\right)+20b\left(8c^4x^4+12c\ldots\right.\right.}{2100x^7\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(20*a*(-1 + c^2*x^2)^2*(15 + 12*c^2*x^2 + 8*c^4*x^4) -
 b*c*x*Sqrt[1 - c^2*x^2]*(-50 + 15*c^2*x^2 + 40*c^4*x^4 + 392*c^6*x^6) + 20
*b*(-1 + c^2*x^2)^2*(15 + 12*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]))/(2100*x^7*(
-1 + c^2*x^2)) - (8*b*c^7*Sqrt[d - c^2*d*x^2]*Log[x])/(105*Sqrt[1 - c^2*x^2
])
```

Maple [C] time = 0.361, size = 2748, normalized size = 10.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x)
```

```
[Out] 73/20*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*
x^2+225)/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)+8/105*b*(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^7+225/7
*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+2
```

```
25)/x^7/(c^2*x^2-1)*arcsin(c*x)-4/35*a*c^2/d/x^5*(-c^2*d*x^2+d)^(3/2)+20/7*
I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+
225)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^8+120/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c
^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/(c^2*x^2-1)*arcsin(c*x)*(-c^
2*x^2+1)^(1/2)*c^7+128/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*
x^6-21*c^4*x^4-315*c^2*x^2+225)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^18+16/15*I*
b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+22
5)*x^9/(c^2*x^2-1)*(-c^2*x^2+1)*c^16-88/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280
*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^7/(c^2*x^2-1)*(-c^2*x^2+
1)*c^14-302/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*
x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-10/7*I*b*(-d*(c^2*x^
2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^3/(c^2*x
^2-1)*(-c^2*x^2+1)*c^10-8/105*a*c^4/d/x^3*(-c^2*d*x^2+d)^(3/2)+64/3*b*(-d*(
c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/
(c^2*x^2-1)*arcsin(c*x)*c^16-56/3*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105
*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^14-16/3*
b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+22
5)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13-4/15*b*(-d*(c^2*x^2-1))^(1/2)/(2
80*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1)*arcsin(c
*x)*c^12-351/5*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4
-315*c^2*x^2+225)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^10+469/60*b*(-d*(c^2*x^2-1)
)^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^2/(c^2*x^2-1
)*c^9*(-c^2*x^2+1)^(1/2)+3057/35*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*
c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x/(c^2*x^2-1)*arcsin(c*x)*c^8-594/35*b*
(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)
/x/(c^2*x^2-1)*arcsin(c*x)*c^6-71/28*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-
105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^2/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1
/2)+342/7*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*
c^2*x^2+225)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^4-255/28*b*(-d*(c^2*x^2-1))^(1/2
)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^4/(c^2*x^2-1)*c^3*
(-c^2*x^2+1)^(1/2)-585/7*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-
21*c^4*x^4-315*c^2*x^2+225)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+75/14*b*(-d*(c^
2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^6/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-16*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)*arcsin(c*x)*c^7/(105*c^2*x^2-105)+128/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(
280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^13/(c^2*x^2-1)*c^20-1
6/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^
2*x^2+225)*x^11/(c^2*x^2-1)*c^18-40/21*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*
x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/(c^2*x^2-1)*c^16-214/105*I*
b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+22
5)*x^7/(c^2*x^2-1)*c^14+152/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105
*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1)*c^12+30/7*I*b*(-d*(c^2
*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^3/(c^
2*x^2-1)*c^10-20/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c
^4*x^4-315*c^2*x^2+225)*x/(c^2*x^2-1)*c^8+64/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(
280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^8/(c^2*x^2-1)*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^15-8*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*
c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^6/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*c^13-8/5*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4
*x^4-315*c^2*x^2+225)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^11-2
4*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^
2+225)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9-1/7*a/d/x^7*(-c^2
*d*x^2+d)^(3/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 3.31668, size = 1218, normalized size = 4.63

$$\left[\frac{16\left(bc^9x^9 - bc^7x^7\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) - \left(8\,bc^5x^5 - \left(8\,bc^5 + 3\,bc^3 - 10\,bc\right)x^7 + 3\,bc^3x^3 - 1\cdots\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/420*(16*(b*c^9*x^9 - b*c^7*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x
^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^
4 - x^2)) - (8*b*c^5*x^5 - (8*b*c^5 + 3*b*c^3 - 10*b*c)*x^7 + 3*b*c^3*x^3 -
 10*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 4*(8*a*c^8*x^8 - 4*a*c
^6*x^6 - a*c^4*x^4 - 18*a*c^2*x^2 + (8*b*c^8*x^8 - 4*b*c^6*x^6 - b*c^4*x^4
- 18*b*c^2*x^2 + 15*b)*arcsin(c*x) + 15*a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 -
 x^7), -1/420*(32*(b*c^9*x^9 - b*c^7*x^7)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 +
 d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)
) + (8*b*c^5*x^5 - (8*b*c^5 + 3*b*c^3 - 10*b*c)*x^7 + 3*b*c^3*x^3 - 10*b*c*
x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(8*a*c^8*x^8 - 4*a*c^6*x^6 -
 a*c^4*x^4 - 18*a*c^2*x^2 + (8*b*c^8*x^8 - 4*b*c^6*x^6 - b*c^4*x^4 - 18*b*c
^2*x^2 + 15*b)*arcsin(c*x) + 15*a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2 + d}(b\arcsin(cx) + a)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^8, x)
```

3.62 $\int x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=256

$$-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^6d^3}+\frac{2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^6d^2}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^6d}-\frac{bcx^7\sqrt{d-c^2}}{49\sqrt{1-c^2}}$$

```
[Out] (8*b*x*Sqrt[d - c^2*d*x^2])/(105*c^5*Sqrt[1 - c^2*x^2]) + (4*b*x^3*Sqrt[d -
 c^2*d*x^2])/(315*c^3*Sqrt[1 - c^2*x^2]) + (b*x^5*Sqrt[d - c^2*d*x^2])/(175
*c*Sqrt[1 - c^2*x^2]) - (b*c*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c^2*x^2]
) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^6*d) + (2*(d - c^2*d*x
^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d^2) - ((d - c^2*d*x^2)^(7/2)*(a + b*
ArcSin[c*x]))/(7*c^6*d^3)
```

Rubi [A] time = 0.20798, antiderivative size = 256, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {266, 43, 4691, 12}

$$-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^6d^3}+\frac{2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^6d^2}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^6d}-\frac{bcx^7\sqrt{d-c^2}}{49\sqrt{1-c^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*x*Sqrt[d - c^2*d*x^2])/(105*c^5*Sqrt[1 - c^2*x^2]) + (4*b*x^3*Sqrt[d -
 c^2*d*x^2])/(315*c^3*Sqrt[1 - c^2*x^2]) + (b*x^5*Sqrt[d - c^2*d*x^2])/(175
*c*Sqrt[1 - c^2*x^2]) - (b*c*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c^2*x^2]
) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^6*d) + (2*(d - c^2*d*x
^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d^2) - ((d - c^2*d*x^2)^(7/2)*(a + b*
ArcSin[c*x]))/(7*c^6*d^3)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}
\int x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx &= -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-8-4c^2x^2-3c^4x^4+15c^6x^6}{105c^6}\,dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx)\right)\int x^5\sqrt{d-c^2dx^2}\,d\\
&= -\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(-8-4c^2x^2-3c^4x^4+15c^6x^6\right)dx}{105c^5\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+b\sin^{-1}(cx)\right)\text{Subst}\\
&= \frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}}-\frac{bcx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+\right.\\
&= \frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}}-\frac{bcx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{\left(d-c\right.}{}
\end{aligned}$$

Mathematica [A] time = 0.164203, size = 157, normalized size = 0.61

$$\frac{\sqrt{d-c^2dx^2}\left(105a\sqrt{1-c^2x^2}\left(15c^6x^6-3c^4x^4-4c^2x^2-8\right)+bcx\left(-225c^6x^6+63c^4x^4+140c^2x^2+840\right)+105b\sqrt{1-c^2x^2}\left(\right.\right.}{11025c^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(b*c*x*(840 + 140*c^2*x^2 + 63*c^4*x^4 - 225*c^6*x^6)
+ 105*a*Sqrt[1 - c^2*x^2]*(-8 - 4*c^2*x^2 - 3*c^4*x^4 + 15*c^6*x^6) + 105*b
*Sqrt[1 - c^2*x^2]*(-8 - 4*c^2*x^2 - 3*c^4*x^4 + 15*c^6*x^6)*ArcSin[c*x]))/
(11025*c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.4, size = 953, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] a*(-1/7*x^4*(-c^2*d*x^2+d)^(3/2)/c^2/d+4/7/c^2*(-1/5*x^2*(-c^2*d*x^2+d)^(3/
2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2)))+b*(1/6272*(-d*(c^2*x^2-1))^(1/2)
*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(
-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))/c^6/(c^2*x^2-1)+3/3200*(-d*(c^2*
x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2
*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arc
sin(c*x))/c^6/(c^2*x^2-1)+1/1152*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^
2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(
c*x))/c^6/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^
(1/2)*x*c-1)*(arcsin(c*x)+I)/c^6/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/(c^2*x^2-1)+1/1152*
(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*
```

```
x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^6/(c^2*x^2-1)+3/3200*(-d
*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*
x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-
I+5*arcsin(c*x))/c^6/(c^2*x^2-1)+1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*
x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^
6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25
*c^2*x^2+1)*(-I+7*arcsin(c*x))/c^6/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.44133, size = 393, normalized size = 1.54

$$\frac{\left(225\,bc^7x^7 - 63\,bc^5x^5 - 140\,bc^3x^3 - 840\,bcx\right)\sqrt{-c^2dx^2 + d}\sqrt{-c^2x^2 + 1} + 105\left(15\,ac^8x^8 - 18\,ac^6x^6 - ac^4x^4 - 4\,ac^2x^2 + \left(\right.\right.}{11025\left(c^8x^2 - c^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*((225*b*c^7*x^7 - 63*b*c^5*x^5 - 140*b*c^3*x^3 - 840*b*c*x)*sqrt(-c
^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 105*(15*a*c^8*x^8 - 18*a*c^6*x^6 - a*c^4
*x^4 - 4*a*c^2*x^2 + (15*b*c^8*x^8 - 18*b*c^6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2
 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.63 $\int x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx$

Optimal. Leaf size=183

$$\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^4d^2}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}$$

```
[Out] (2*b*x*Sqrt[d - c^2*d*x^2])/(15*c^3*Sqrt[1 - c^2*x^2]) + (b*x^3*Sqrt[d - c^
2*d*x^2])/(45*c*Sqrt[1 - c^2*x^2]) - (b*c*x^5*Sqrt[d - c^2*d*x^2])/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^4*d) + ((
d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d^2)
```

Rubi [A] time = 0.168046, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {266, 43, 4691, 12}

$$\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^4d^2}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*x*Sqrt[d - c^2*d*x^2])/(15*c^3*Sqrt[1 - c^2*x^2]) + (b*x^3*Sqrt[d - c^
2*d*x^2])/(45*c*Sqrt[1 - c^2*x^2]) - (b*c*x^5*Sqrt[d - c^2*d*x^2])/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^4*d) + ((
d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx = -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-2-c^2x^2+3c^4x^4}{15c^4}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int x^3\sqrt{d-c^2dx^2}\,dx$$

$$= -\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+3c^4x^4\right)dx}{15c^3\sqrt{1-c^2x^2}} + \frac{1}{2}\left(a+b\sin^{-1}(cx)\right)\text{Subst}\left(\int x$$

$$= \frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}} - \frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + \frac{1}{2}\left(a+b\sin^{-1}(cx)\right)\text{Su}$$

$$= \frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}} - \frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\,\text{si}\right.}{3c^4d}$$

Mathematica [A] time = 0.0853771, size = 134, normalized size = 0.73

$$\frac{\sqrt{d-c^2dx^2}\left(15a\sqrt{1-c^2x^2}\left(3c^4x^4-c^2x^2-2\right)+b\left(-9c^5x^5+5c^3x^3+30cx\right)+15b\sqrt{1-c^2x^2}\left(3c^4x^4-c^2x^2-2\right)\sin^{-1}(cx\right.}{225c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(15*a*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4) + b
*(30*c*x + 5*c^3*x^3 - 9*c^5*x^5) + 15*b*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 +
3*c^4*x^4)*ArcSin[c*x]))/(225*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.277, size = 617, normalized size = 3.4

$$a\left(-\frac{x^2}{5\,c^2d}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-\frac{2}{15\,dc^4}\left(-c^2dx^2+d\right)^{\frac{3}{2}}\right)+b\left(\frac{i+5\,\arcsin(cx)}{800\,c^4\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(16\,c^6x^6-28\,c^4x^4-16\,i\sqrt{-c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] a*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2))+b*(
1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)
*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*
x*c-1)*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^
4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1
)*(I+3*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*
(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2
-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^4/(c^2*x^
2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4
-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^4/(c^2*x^2-1)
+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-2
0*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2
*x^2-1)*(-I+5*arcsin(c*x))/c^4/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.44425, size = 319, normalized size = 1.74

$$\frac{\left(9\,bc^5x^5 - 5\,bc^3x^3 - 30\,bcx\right)\sqrt{-c^2dx^2 + d}\sqrt{-c^2x^2 + 1} + 15\left(3\,ac^6x^6 - 4\,ac^4x^4 - ac^2x^2 + \left(3\,bc^6x^6 - 4\,bc^4x^4 - bc^2x^2 + 2\,b\right)\mathrm{a}\right.}{225\left(c^6x^2 - c^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*((9*b*c^5*x^5 - 5*b*c^3*x^3 - 30*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^
2*x^2 + 1) + 15*(3*a*c^6*x^6 - 4*a*c^4*x^4 - a*c^2*x^2 + (3*b*c^6*x^6 - 4*b
*c^4*x^4 - b*c^2*x^2 + 2*b)*arcsin(c*x) + 2*a)*sqrt(-c^2*d*x^2 + d))/(c^6*x
^2 - c^4)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3\sqrt{-d\,(cx-1)\,(cx+1)}\,(a + b\,\mathrm{asin}\,(cx))\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.64 $\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=110

$$-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}$$

```
[Out] (b*x*Sqrt[d - c^2*d*x^2])/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*x^3*Sqrt[d - c^2*d
*x^2])/(9*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*c^2*d)
```

Rubi [A] time = 0.0680963, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.04, Rules used = {4677}

$$-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*x*Sqrt[d - c^2*d*x^2])/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*x^3*Sqrt[d - c^2*d
*x^2])/(9*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*c^2*d)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx&=-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d}+\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)\,dx}{3c\sqrt{1-c^2x^2}}\\&=\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d}\end{aligned}$$

Mathematica [A] time = 0.0841051, size = 70, normalized size = 0.64

$$\frac{\sqrt{d-c^2dx^2}\left(\left(c^2x^2-1\right)\left(a+b\sin^{-1}(cx)\right)+\frac{bc\left(x-\frac{c^2x^3}{3}\right)}{\sqrt{1-c^2x^2}}\right)}{3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((b*c*(x - (c^2*x^3)/3))/Sqrt[1 - c^2*x^2] + (-1 + c^2
*x^2)*(a + b*ArcSin[c*x])))/(3*c^2)
```

Maple [C] time = 0.137, size = 343, normalized size = 3.1

$$-\frac{a}{3c^2d}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+b\left(\frac{i+3\arcsin(cx)}{72c^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(4c^4x^4-5c^2x^2-4i\sqrt{-c^2x^2+1}x^3c^3+3i\sqrt{-c^2x^2+1}xc+1\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/3*a/c^2/d*(-c^2*d*x^2+d)^(3/2)+b*(1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4
-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+
3*arcsin(c*x))/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*
x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/
72*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c
^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))
```

Maxima [A] time = 1.67976, size = 101, normalized size = 0.92

$$-\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}b\arcsin(cx)}{3c^2d}-\frac{\left(c^2d^{\frac{3}{2}}x^3-3d^{\frac{3}{2}}x\right)b}{9cd}-\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}a}{3c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/3*(-c^2*d*x^2 + d)^(3/2)*b*arcsin(c*x)/(c^2*d) - 1/9*(c^2*d^(3/2)*x^3 -
3*d^(3/2)*x)*b/(c*d) - 1/3*(-c^2*d*x^2 + d)^(3/2)*a/(c^2*d)
```

Fricas [A] time = 2.32224, size = 248, normalized size = 2.25

$$\frac{\left(bc^3x^3-3bcx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+3\left(ac^4x^4-2ac^2x^2+\left(bc^4x^4-2bc^2x^2+b\right)\arcsin(cx)+a\right)\sqrt{-c^2dx^2+d}}{9\left(c^4x^2-c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9*((b*c^3*x^3 - 3*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3*(a*c
^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsin(c*x) + a)*sqrt(
-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.65 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x} dx$

Optimal. Leaf size=203

$$\frac{ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{2\sqrt{d-c^2}}{}$$

```
[Out] -((b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x^2]) + Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*A
rcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I
*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.209705, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4697, 4709, 4183, 2279, 2391, 8}

$$\frac{ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{2\sqrt{d-c^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -((b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x^2]) + Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*A
rcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I
*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\int\frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int}{\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int(a+bx\right.}{\sqrt{1-c^2}}$$

$$=-\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right.}{\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right.}{\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right.}{\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.51766, size = 187, normalized size = 0.92

$$\frac{b\sqrt{d-c^2dx^2}\left(i\mathrm{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\mathrm{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\sin^{-1}(cx)-cx+\sin^{-1}(cx)\log\left(1-e^{i\sin\cdots}\right.\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] a*Sqrt[d - c^2*d*x^2] + a*Sqrt[d]*Log[x] - a*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d
 - c^2*d*x^2]] + (b*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*Ar
cSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c
*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [A] time = 0.154, size = 413, normalized size = 2.

$$-\sqrt{d}\ln\left(\frac{1}{x}\left(2d+2\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)a+\sqrt{-c^2dx^2+d}a+\frac{b\arcsin(cx)x^2c^2}{c^2x^2-1}\sqrt{-d\left(c^2x^2-1\right)}+\frac{xbc}{c^2x^2-1}\sqrt{-d\left(c^2x^2-1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x)
```

```
[Out] -d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)*a+(-c^2*d*x^2+d)^(1/2)*
a+b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2+b*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c-b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x
^2-1)*arcsin(c*x)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*a
rcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*b*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*polylo
g(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-d(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}(cx))}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x, x)
```

3.66 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=225

$$-\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{c^2}{}$$

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(2*x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x]))/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*
ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((I/2)*b*c^2*Sqrt[d - c^2*d
*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((I/2)*b*c^2*Sqrt
[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.207735, antiderivative size = 225, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4693, 30, 4709, 4183, 2279, 2391}

$$-\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{c^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(2*x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x]))/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*
ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((I/2)*b*c^2*Sqrt[d - c^2*d
*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((I/2)*b*c^2*Sqrt
[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{1}{x^2}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int \frac{a+}{}}{2\sqrt{1-c^2}}$$

$$=-\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}-\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+\right.}{2\sqrt{1-}}$$

$$=-\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$=-\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$=-\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 2.02804, size = 239, normalized size = 1.06

$$\frac{1}{8}\left(\frac{bc^2d\sqrt{1-c^2x^2}\left(-4i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+4i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-4\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right)+4\sin^{-1}\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] ((-4*a*Sqrt[d - c^2*d*x^2])/x^2 - 4*a*c^2*Sqrt[d]*Log[x] + 4*a*c^2*Sqrt[d]*
Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*c^2*d*Sqrt[1 - c^2*x^2]*(-2*Cot[A
rcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^
(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog
[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]
*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2])/8
```

Maple [B] time = 0.222, size = 462, normalized size = 2.1

$$-\frac{a}{2dx^2}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{ac^2}{2}\sqrt{d}\ln\left(\frac{1}{x}\left(2d+2\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)-\frac{ac^2}{2}\sqrt{-c^2dx^2+d}-\frac{b\arcsin(cx)c^2}{2c^2x^2-2}\sqrt{-d\left(c^2x^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(3/2)+1/2*a*d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x
^2+d)^(1/2))/x)*c^2-1/2*a*(-c^2*d*x^2+d)^(1/2)*c^2-1/2*b*(-d*(c^2*x^2-1))^(
1/2)/(c^2*x^2-1)*arcsin(c*x)*c^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x
*(-c^2*x^2+1)^(1/2)*c+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x^2*arcsin(c
*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2-2)*arcsin(c*
x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)*c^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2-2)*polylog(2,-I*c*x-(-c^2
*x^2+1)^(1/2))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2
-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-d(cx-1)(cx+1)}\,(a+b\,\text{asin}(cx))}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^3, x)
```

3.67 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=301

$$-\frac{ibc^4\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{ibc^4\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8x^2}-$$

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(12*x^3*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c^2
*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
)/(4*x^4) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*x^2) + (c^4*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt[1
 - c^2*x^2]) - ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] + ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*A
rcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.294422, antiderivative size = 301, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4693, 30, 4701, 4709, 4183, 2279, 2391}

$$-\frac{ibc^4\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{ibc^4\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8x^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^5,x]
```


```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(12*x^3*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c^2
*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
)/(4*x^4) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*x^2) + (c^4*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt[1
 - c^2*x^2]) - ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] + ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*A
rcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
```

```
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^5}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{1}{x^4}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int\frac{a}{x}}{4\sqrt{1-c^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{8x^2}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{c^2\sqrt{d-c^2d}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{c^2\sqrt{d-c^2d}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{c^2\sqrt{d-c^2d}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{c^2\sqrt{d-c^2d}}{}$$

Mathematica [A] time = 3.93246, size = 321, normalized size = 1.07

$$bc^4\sqrt{d-c^2dx^2}\left(-24i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+24i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\frac{16\sin^4\left(\frac{1}{2}\sin^{-1}(cx)\right)}{c^3x^3}-24\sin^{-1}(cx)\log\left(1-e^{i\sin}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*(-2 + c^2*x^2)*Sqrt[d - c^2*d*x^2])/(8*x^4) - (a*c^4*Sqrt[d]*Log[x])/8 +
 (a*c^4*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/8 + (b*c^4*Sqrt[d - c
^2*d*x^2]*(8*Cot[ArcSin[c*x]/2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - c*x*
Csc[ArcSin[c*x]/2]^4 - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcSin[c*x]*
Log[1 - E^(I*ArcSin[c*x])] + 24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (2
4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin[c*x])]
- 6*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^4 -
 (16*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*Sqrt[1 -
 c^2*x^2])
```

Maple [A] time = 0.293, size = 571, normalized size = 1.9

$$-\frac{a}{4dx^4}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-\frac{ac^2}{8dx^2}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{ac^4}{8}\sqrt{d}\ln\left(\frac{1}{x}\left(2d+2\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)-\frac{ac^4}{8}\sqrt{-c^2dx^2+d}+\frac{b\arcsin(c}{8c^2x^2-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(3/2)-1/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(3/2)+1/8*
a*c^4*d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-1/8*a*c^4*(-c^2*d*
x^2+d)^(1/2)+1/8*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c^4-1/8*b
*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x*(-c^2*x^2+1)^(1/2)*c^3-3/8*b*(-d*(c^2
*x^2-1))^(1/2)/(c^2*x^2-1)/x^2*arcsin(c*x)*c^2+1/12*b*(-d*(c^2*x^2-1))^(1/2
)/(c^2*x^2-1)/x^3*(-c^2*x^2+1)^(1/2)*c+1/4*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^
2-1)/x^4*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4/(8*c^2
*x^2-8)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)*c^4/(8*c^2*x^2-8)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(
1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4/(8*c^2*x^2-8)*polyl
og(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)*c^4/(8*c^2*x^2-8)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^5, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**5, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^5, x)
```

3.68 $\int x^4 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=340

$$\frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{16}dx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{dx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{64c^2}-\frac{3dx\sqrt{d-\ldots}}{}$$

```
[Out] (3*b*d*x^2*Sqrt[d - c^2*d*x^2])/(256*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^4*Sqrt
[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (b*c*d*x^6*Sqrt[d - c^2*d*x^2]
)/(32*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^8*Sqrt[d - c^2*d*x^2])/(64*Sqrt[1 - c
^2*x^2]) - (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^4) - (d*x
^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(64*c^2) + (d*x^5*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x]))/8 + (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(256*b*c^5*Sqrt[1
 - c^2*x^2])
```

Rubi [A] time = 0.405304, antiderivative size = 340, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4699, 4697, 4707, 4641, 30, 14}

$$\frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{16}dx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{dx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{64c^2}-\frac{3dx\sqrt{d-\ldots}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*x^2*Sqrt[d - c^2*d*x^2])/(256*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^4*Sqrt
[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (b*c*d*x^6*Sqrt[d - c^2*d*x^2]
)/(32*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^8*Sqrt[d - c^2*d*x^2])/(64*Sqrt[1 - c
^2*x^2]) - (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^4) - (d*x
^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(64*c^2) + (d*x^5*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x]))/8 + (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(256*b*c^5*Sqrt[1
 - c^2*x^2])
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
```

```
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^4 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{8}x^5 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}(3d)\int x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.$$

$$=\frac{1}{16}dx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+$$

$$=-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{dx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{64c^2}$$

$$=\frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{3dx\sqrt{d-c^2dx}}{1}$$

$$=\frac{3bdx^2\sqrt{d-c^2dx^2}}{256c^3\sqrt{1-c^2x^2}}+\frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2}}{64\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.192092, size = 193, normalized size = 0.57

$$\frac{d\sqrt{d-c^2dx^2}\left(3a^2-2abcx\sqrt{1-c^2x^2}\left(16c^6x^6-24c^4x^4+2c^2x^2+3\right)-2b\sin^{-1}(cx)\left(bcx\sqrt{1-c^2x^2}\left(16c^6x^6-24c^4x^4+2\right.\right.\right.}{256bc^5\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(3*a^2 + b^2*c^2*x^2*(3 + c^2*x^2 - 8*c^4*x^4 + 4*c^
6*x^6) - 2*a*b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x
^6) - 2*b*(-3*a + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2 - 24*c^4*x^4 + 16*
c^6*x^6))*ArcSin[c*x] + 3*b^2*ArcSin[c*x]^2))/(256*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.339, size = 600, normalized size = 1.8

$$-\frac{ax^3}{8c^2d}\left(-c^2dx^2+d\right)^{\frac{5}{2}}-\frac{ax}{16c^4d}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+\frac{ax}{64c^4}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{3adx}{128c^4}\sqrt{-c^2dx^2+d}+\frac{3ad^2}{128c^4}\arctan\left(x\sqrt{c^2d}\frac{}{\sqrt{-c}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/8*a*x^3*(-c^2*d*x^2+d)^(5/2)/c^2/d-1/16*a/c^4*x*(-c^2*d*x^2+d)^(5/2)/d+1
/64*a/c^4*x*(-c^2*d*x^2+d)^(3/2)+3/128*a/c^4*d*x*(-c^2*d*x^2+d)^(1/2)+3/128
*a/c^4*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-3/256
*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^2*
d-1/64*b*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^8+1/
32*b*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^6-1/256*b*
(-d*(c^2*x^2-1))^(1/2)*d/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-3/256*b*(-d*(
c^2*x^2-1))^(1/2)*d/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2-1/8*b*(-d*(c^2*x
^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)*x^9+5/16*b*(-d*(c^2*x^2-1))^(1/2
)*d*c^2/(c^2*x^2-1)*arcsin(c*x)*x^7-13/64*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x
^2-1)*arcsin(c*x)*x^5-1/128*b*(-d*(c^2*x^2-1))^(1/2)*d/c^2/(c^2*x^2-1)*arcs
in(c*x)*x^3+3/128*b*(-d*(c^2*x^2-1))^(1/2)*d/c^4/(c^2*x^2-1)*arcsin(c*x)*x+
15/8192*b*(-d*(c^2*x^2-1))^(1/2)*d/c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(ac^2dx^6-adx^4+\left(bc^2dx^6-bdx^4\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^6 - a*d*x^4 + (b*c^2*d*x^6 - b*d*x^4)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^4, x)
```

3.69 $\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=265

$$\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}dx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{16c^2}+\frac{d\sqrt{d-c^2dx^2}}{32bc}$$

```
[Out] (b*d*x^2*Sqrt[d - c^2*d*x^2])/(32*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[
d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqrt[d - c^2*d*x^2])/
(36*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*
c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 + (x^3*(d - c^2*d*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^2)/(32*b*c^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.319808, antiderivative size = 265, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4699, 4697, 4707, 4641, 30, 14}

$$\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}dx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{16c^2}+\frac{d\sqrt{d-c^2dx^2}}{32bc}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*d*x^2*Sqrt[d - c^2*d*x^2])/(32*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[
d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqrt[d - c^2*d*x^2])/
(36*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*
c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 + (x^3*(d - c^2*d*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^2)/(32*b*c^3*Sqrt[1 - c^2*x^2])
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{6}x^3 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) + \frac{1}{2}d \int x^2\sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx)\right.$$

$$= \frac{1}{8}dx^3\sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx)\right) + \frac{1}{6}x^3 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) +$$

$$= -\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx)\right.}{16c^2}$$

$$= \frac{bdx^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} - \frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx}}{}$$

Mathematica [A] time = 0.15862, size = 170, normalized size = 0.64

$$\frac{d\sqrt{d-c^2dx^2} \left(9a^2 - 6abcx\sqrt{1-c^2x^2} \left(8c^4x^4 - 14c^2x^2 + 3\right) + 6b\sin^{-1}(cx) \left(3a + bcx\sqrt{1-c^2x^2} \left(-8c^4x^4 + 14c^2x^2 - 3\right)\right) + \right.}{288bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(9*a^2 + b^2*c^2*x^2*(9 - 21*c^2*x^2 + 8*c^4*x^4) -
6*a*b*c*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + 6*b*(3*a + b*c*x
*Sqrt[1 - c^2*x^2]*(-3 + 14*c^2*x^2 - 8*c^4*x^4))*ArcSin[c*x] + 9*b^2*ArcSi
n[c*x]^2))/(288*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.28, size = 489, normalized size = 1.9

$$-\frac{ax}{6\,c^2d}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+\frac{ax}{24\,c^2}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{adx}{16\,c^2}\sqrt{-c^2dx^2+d}+\frac{ad^2}{16\,c^2}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{bdc^4\,\mathrm{ar}}{6\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/6*a*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/24*a/c^2*x*(-c^2*d*x^2+d)^(3/2)+1/16*
a/c^2*d*x*(-c^2*d*x^2+d)^(1/2)+1/16*a/c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/6*b*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1
)*arcsin(c*x)*x^7+11/24*b*(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c
*x)*x^5-17/48*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^3+1/16*b
*(-d*(c^2*x^2-1))^(1/2)*d/c^2/(c^2*x^2-1)*arcsin(c*x)*x-7/2304*b*(-d*(c^2*x
^2-1))^(1/2)*d/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-1/32*b*(-d*(c^2*x^2-1))^(
1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*d-1/36*b*(-d*(c^2*x^2
-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^6+7/96*b*(-d*(c^2*x^2-1))
^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-1/32*b*(-d*(c^2*x^2-1))^(1/2)
*d/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\left(ac^2dx^4-adx^2+\left(bc^2dx^4-bdx^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^4 - a*d*x^2 + (b*c^2*d*x^4 - b*d*x^2)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}} (b \arcsin (cx) + a)x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^2, x)
```

3.70 $\int \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=188

$$\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{3}{8}dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-}}{16\sqrt{1-c^2}}$$

```
[Out] (-5*b*c*d*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^4*Sq
rt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 + (x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.105156, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4649, 4647, 4641, 30, 14}

$$\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{3}{8}dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-}}{16\sqrt{1-c^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*b*c*d*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^4*Sq
rt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 + (x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}(3d)\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) d$$

$$= \frac{3}{8}dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{(3d}{}$$

$$= -\frac{5bcdx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{3}{8}dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)$$

Mathematica [A] time = 0.549964, size = 210, normalized size = 1.12

$$\frac{d\sqrt{d-c^2dx^2}\left(16acx\sqrt{1-c^2x^2}\left(5-2c^2x^2\right)+16b\cos\left(2\sin^{-1}(cx)\right)+b\cos\left(4\sin^{-1}(cx)\right)\right)-48ad^{3/2}\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx}{\sqrt{d}}\right.}{128c\sqrt{1-c^2x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 - 48*a*d^(3/2)*Sqrt[1 - c^2*x^2]*
ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + d*Sqrt[d - c^2
*d*x^2]*(16*a*c*x*(5 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 16*b*Cos[2*ArcSin[c*x
]] + b*Cos[4*ArcSin[c*x]]) + 4*b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(8*Sin[2
*ArcSin[c*x]] + Sin[4*ArcSin[c*x]]))/(128*c*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.14, size = 371, normalized size = 2.

$$\frac{ax}{4}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{3\,adx}{8}\sqrt{-c^2dx^2+d}+\frac{3\,ad^2}{8}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{3\,b\left(\arcsin(cx)\right)^2d}{16\,c\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/4*a*x*(-c^2*d*x^2+d)^(3/2)+3/8*a*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a*d^2/(c^2*
d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-3/16*b*(-d*(c^2*x^2-1
))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d-1/4*b*(-d*(c^2*x^
2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)*x^5+7/8*b*(-d*(c^2*x^2-1))^(1/2)*
d*c^2/(c^2*x^2-1)*arcsin(c*x)*x^3-17/128*b*(-d*(c^2*x^2-1))^(1/2)*d/c/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)-5/8*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin
(c*x)*x-1/16*b*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*
```

```
x^4+5/16*b*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(ac^2dx^2 - ad + \left(bc^2dx^2 - bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-d\left(cx - 1\right)\left(cx + 1\right)\right)^{\frac{3}{2}} \left(a + b\,\text{asin}\left(cx\right)\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a), x)
```

3.71 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=185

$$-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{3cd\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4b\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{bc^3dx^2\sqrt{}}{4\sqrt{1}}$$

```
[Out] (b*c^3*d*x^2*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) - (3*c^2*d*x*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin
[c*x]))/x - (3*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 -
 c^2*x^2]) + (b*c*d*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.167893, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4695, 4647, 4641, 30, 14}

$$-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{3cd\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4b\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{bc^3dx^2\sqrt{}}{4\sqrt{1}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^2,x]
```


```
[Out] (b*c^3*d*x^2*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) - (3*c^2*d*x*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin
[c*x]))/x - (3*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 -
 c^2*x^2]) + (b*c*d*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x} - \left(3c^2d\right)\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx + $$

$$= -\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x} + \frac{\left(bcd\sqrt{d\right.}}{}$$

$$= \frac{bc^3dx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\,\mathrm{s}\right.}{x}$$

Mathematica [A] time = 0.536894, size = 222, normalized size = 1.2

$$\frac{3}{2}acd^{3/2}\tan^{-1}\left(\frac{cx\sqrt{-d\left(c^2x^2-1\right)}}{\sqrt{d}\left(c^2x^2-1\right)}\right) + \sqrt{-d\left(c^2x^2-1\right)}\left(-\frac{1}{2}ac^2dx - \frac{ad}{x}\right) - \frac{bcd\sqrt{d\left(1-c^2x^2\right)}\left(\frac{2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{cx} - 2\log(cx) + \right.}{2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-((a*d)/x) - (a*c^2*d*x)/2)*Sqrt[-(d*(-1 + c^2*x^2))] + (3*a*c*d^(3/2)*Arc
Tan[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/2 - (b*c*d*S
qrt[d*(1 - c^2*x^2)]*((2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]
^2 - 2*Log[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (b*c*d*Sqrt[d*(1 - c^2*x^2)]*(Cos
[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x] + Sin[2*ArcSin[c*x]])))/(8*Sqr
t[1 - c^2*x^2])
```

Maple [C] time = 0.201, size = 464, normalized size = 2.5

$$-\frac{a}{dx}\left(-c^2dx^2+d\right)^{\frac{5}{2}} - ac^2x\left(-c^2dx^2+d\right)^{\frac{3}{2}} - \frac{3\,ac^2dx}{2}\sqrt{-c^2dx^2+d} - \frac{3\,ac^2d^2}{2}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}} + \frac{3\,b\,(\mathrm{ar}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(5/2)-a*c^2*x*(-c^2*d*x^2+d)^(3/2)-3/2*a*c^2*d*x*(-c^
2*d*x^2+d)^(1/2)-3/2*a*c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2))+3/4*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*
arcsin(c*x)^2*d*c-1/4*b*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+
```

```
1)^(1/2)*x^2-1/2*b*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)*x^3
+1/8*b*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+I*b*(-c^2*
x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*d*c-1/2*b*(-d*(
c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)*x+b*(-d*(c^2*x^2-1))^(1/2)*
arcsin(c*x)*d/(c^2*x^2-1)/x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^
2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(ac^2dx^2 - ad + \left(bc^2dx^2 - bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-d\left(cx - 1\right)\left(cx + 1\right)\right)^{\frac{3}{2}}\left(a + b\operatorname{asin}\left(cx\right)\right)}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^2, x)
```

3.72 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=191

$$\frac{c^3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2b\sqrt{1-c^2x^2}}+\frac{c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}$$

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(6*x^2*Sqrt[1 - c^2*x^2]) + (c^2*d*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x]))/x - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]
))/(3*x^3) + (c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[1
- c^2*x^2]) - (4*b*c^3*d*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.228927, antiderivative size = 191, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4695, 4693, 29, 4641, 14}

$$\frac{c^3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2b\sqrt{1-c^2x^2}}+\frac{c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(6*x^2*Sqrt[1 - c^2*x^2]) + (c^2*d*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x]))/x - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]
))/(3*x^3) + (c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[1
- c^2*x^2]) - (4*b*c^3*d*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3} - \left(c^2d\right)\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx$$

$$= \frac{c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3} + \frac{\left(bcd\sqrt{d}\right.}{}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} + \frac{c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\,\mathrm{si}\right.}{3x^3}$$

Mathematica [A] time = 0.73822, size = 211, normalized size = 1.1

$$-\frac{d\sqrt{d-c^2dx^2}\left(2a\left(1-4c^2x^2\right)\sqrt{1-c^2x^2}+8bc^3x^3\log(cx)+bcx\right)}{6x^3\sqrt{1-c^2x^2}} - ac^3d^{3/2}\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(c^2x^2-1\right)}\right) + \frac{bc^3d\sqrt{d-c^2dx^2}\,\mathrm{s}}{2\sqrt{1-c^2x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*d*(-1 + 4*c^2*x^2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(3*x^3) + (b*c^3*d*S
qrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/(2*Sqrt[1 - c^2*x^2]) - a*c^3*d^(3/2)*Arc
Tan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - (d*Sqrt[d - c^2*d
*x^2]*(b*c*x + 2*a*(1 - 4*c^2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c^3*x^3*Log[c*x]
))/(6*x^3*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.251, size = 1289, normalized size = 6.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(5/2)+2/3*a*c^2/d/x*(-c^2*d*x^2+d)^(5/2)+2/3*a*
c^4*x*(-c^2*d*x^2+d)^(3/2)+a*c^4*d*x*(-c^2*d*x^2+d)^(1/2)+a*c^4*d^2/(c^2*d)
^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*b*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c^3*d-2/3*I*b*(-d*(c^2*x
^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+4/3*I*b*(-d*(c^2*
x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)*c^3+32*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^
2*x^2-1)*arcsin(c*x)*c^8-12*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*
```

```
x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+10/3*I*b*(-d*(c^2
*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-8/3*I*b*(-d*(
c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c
^6-52*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*a
rcsin(c*x)*c^6+32*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4
/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7+2/3*I*b*(-d*(c^2*x^2-1))^(1
/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4+4*b*(-d*(c^2*
x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
*c^5-8*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*d/(3*c
^2*x^2-3)+73/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x
^2-1)*arcsin(c*x)*c^4-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^
2+1)*x^5/(c^2*x^2-1)*c^8-3/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x
^2+1)/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-14/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(2
4*c^4*x^4-9*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^2+1/6*b*(-d*(c^2*x^2-1))
^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/3*
b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(
c*x)+4/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+
(-c^2*x^2+1)^(1/2))^2-1)*c^3*d
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(ac^2dx^2 - ad + \left(bc^2dx^2 - bd\right)\arcsin(cx)\right)\sqrt{-c^2dx^2 + d}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^4, x)
```

3.73 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^6}\,dx$

Optimal. Leaf size=154

$$-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^5d\log(x)\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}}$$

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(20*x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt[d -
 c^2*d*x^2])/(5*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcS
in[c*x]))/(5*d*x^5) + (b*c^5*d*Sqrt[d - c^2*d*x^2]*Log[x])/(5*Sqrt[1 - c^2*
x^2])
```

Rubi [A] time = 0.113988, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4681, 266, 43}

$$-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^5d\log(x)\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^6,x]
```


```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(20*x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt[d -
 c^2*d*x^2])/(5*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcS
in[c*x]))/(5*d*x^5) + (b*c^5*d*Sqrt[d - c^2*d*x^2]*Log[x])/(5*Sqrt[1 - c^2*
x^2])
```


Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^6}dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5} + \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2}{x^5}dx}{5\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5} + \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{\left(1-c^2x\right)^2}{x^3}dx, x,\right.}{10\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5} + \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{x^3}-\frac{2c^2}{x^2}+\frac{c^4}{x}\right.\right.}{10\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}} - \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5dx^5} + \frac{bc^5d}{}$$

Mathematica [A] time = 0.169931, size = 144, normalized size = 0.94

$$\frac{bc^5d\log(x)\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}} - \frac{d\sqrt{d-c^2dx^2}\left(12a\left(c^2x^2-1\right)^3+bcx\sqrt{1-c^2x^2}\left(-25c^4x^4+12c^2x^2-3\right)+12b\left(c^2x^2-1\right)^3\sin^{-1}\right.}{60x^5\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -(d*Sqrt[d - c^2*d*x^2]*(12*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 - c^2*x^2]*(-
3 + 12*c^2*x^2 - 25*c^4*x^4) + 12*b*(-1 + c^2*x^2)^3*ArcSin[c*x]))/(60*x^5*
(-1 + c^2*x^2)) + (b*c^5*d*Sqrt[d - c^2*d*x^2]*Log[x])/(5*Sqrt[1 - c^2*x^2]
)
```

Maple [C] time = 0.283, size = 2350, normalized size = 15.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x)
```

```
[Out] I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*
x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-I*b*(-d*(c^2*x^2-1))^(1/
2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^8/(c^2*x^2-1)*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)*c^13+2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^
6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^6/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)*c^11-2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^
2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9-b*(-d*(c^2*x^2-
1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^6/(c^2*x^2-1)*(
-c^2*x^2+1)^(1/2)*c^11+5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+1
0*c^4*x^4-5*c^2*x^2+1)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^12-b*(-d*(c^2*x^2-1))^
(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^9/(c^2*x^2-1)*arcsi
n(c*x)*c^14+1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x
^4-5*c^2*x^2+1)*x^9/(c^2*x^2-1)*c^14-13/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*
c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^7/(c^2*x^2-1)*c^12+3/4*I*b*(-d
*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^5/(c^
2*x^2-1)*c^10-7/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^
4*x^4-5*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^8+1/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5
```

```
*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x/(c^2*x^2-1)*c^6+2*I*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5*d/(5*c^2*x^2-5)-8/5*b*(-
d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^3/(c
^2*x^2-1)*arcsin(c*x)*c^2+1/20*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6
*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+14*b*(-d*
(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3/(c^2
*x^2-1)*arcsin(c*x)*c^8-5/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^
6+10*c^4*x^4-5*c^2*x^2+1)*x^2/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)-56/5*b*(-d
*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x/(c^2*
x^2-1)*arcsin(c*x)*c^6+28/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^
6+10*c^4*x^4-5*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^4-9/20*b*(-d*(c^2*x^2
-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^2/(c^2*x^2-1)*
c^3*(-c^2*x^2+1)^(1/2)+9/4*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6
+10*c^4*x^4-5*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9-11*b*(-d*(c
^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^5/(c^2*x
^2-1)*arcsin(c*x)*c^10+3/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6
+10*c^4*x^4-5*c^2*x^2+1)/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)+1/5*b*(-d*(c^2*
x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^5/(c^2*x^2-
1)*arcsin(c*x)-1/5*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*
ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^5*d-1/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/
(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^
6-1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x
^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+1/5*I*b*(-d*(c^2*x^2-1
))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^7/(c^2*x^2-1)*(-
c^2*x^2+1)*c^12-9/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*
c^4*x^4-5*c^2*x^2+1)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^10+3/10*I*b*(-d*(c^2*x^
2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3/(c^2*x^2-1)
*(-c^2*x^2+1)*c^8-1/5*a/d/x^5*(-c^2*d*x^2+d)^(5/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.5148, size = 1103, normalized size = 7.16

$$\left[\frac{2\left(bc^7dx^7-bc^5dx^5\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right)-\left(4\,bc^3dx^3-\left(4\,bc^3-bc\right)dx^5-bcdx\right)\sqrt{-c^2dx^2+}}{20\left(c^2x^7\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [1/20*(2*(b*c^7*d*x^7 - b*c^5*d*x^5)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d
*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*
x^4 - x^2)) - (4*b*c^3*d*x^3 - (4*b*c^3 - b*c)*d*x^5 - b*c*d*x)*sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(a*c^6*d*x^6 - 3*a*c^4*d*x^4 + 3*a*c^2*d*x
^2 - a*d + (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d*x^2 - b*d)*arcsin(c*x))
```

```
*sqrt(-c^2*d*x^2 + d))/(c^2*x^7 - x^5), 1/20*(4*(b*c^7*d*x^7 - b*c^5*d*x^5)
*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)
/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) - (4*b*c^3*d*x^3 - (4*b*c^3 - b*c)*d*x^
5 - b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(a*c^6*d*x^6 - 3*a
*c^4*d*x^4 + 3*a*c^2*d*x^2 - a*d + (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d
*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^7 - x^5)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^6, x)
```

3.74 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^8}\,dx$

Optimal. Leaf size=231

$$-\frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{35dx^5}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}-\frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}}+\frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-}}{42x^6\sqrt{1}}$$

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(42*x^6*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(35*x^4*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])/(
70*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(7*
d*x^7) - (2*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) + (2*
b*c^7*d*Sqrt[d - c^2*d*x^2]*Log[x])/(35*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.16388, antiderivative size = 231, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {271, 264, 4691, 12, 446, 76}

$$-\frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{35dx^5}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}-\frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}}+\frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-}}{42x^6\sqrt{1}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^8,x]
```


```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(42*x^6*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(35*x^4*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])/(
70*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(7*
d*x^7) - (2*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) + (2*
b*c^7*d*Sqrt[d - c^2*d*x^2]*Log[x])/(35*Sqrt[1 - c^2*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 76

```
Int[((d_.)*(x_))^(n_.)*((a_) + (b_.)*(x_))*((e_) + (f_.)*(x_))^(p_.), x_Sym
bol] :> Int[ExpandIntegrand[(a + b*x)*(d*x)^n*(e + f*x)^p, x], x] /; FreeQ[
{a, b, d, e, f, n}, x] && IGtQ[p, 0] && (NeQ[n, -1] || EqQ[p, 1]) && NeQ[b*
e + a*f, 0] && ( !IntegerQ[n] || LtQ[9*p + 5*n, 0] || GeQ[n + p + 1, 0] ||
(GeQ[n + p + 2, 0] && RationalQ[a, b, d, e, f])) && (NeQ[n + p + 3, 0] || E
qQ[p, 1])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^8}\,dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(-5-2c^2x^2\right)\left(1-c^2x^2\right)^2}{35x^7}\,dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx)\right)\int \frac{\left(d-c^2dx^2\right)^{3/}}{x^8}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(-5-2c^2x^2\right)\left(1-c^2x^2\right)^2}{x^7}\,dx}{35\sqrt{1-c^2x^2}}+$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}-\frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{35dx^5}-\frac{(bc}{}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}-\frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{35dx^5}-\frac{(bc}{}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+}{7dx^7}$$

Mathematica [A] time = 0.18152, size = 173, normalized size = 0.75

$$\frac{2bc^7d\log(x)\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}-\frac{d\sqrt{d-c^2dx^2}\left(30a\left(2c^2x^2+5\right)\left(c^2x^2-1\right)^3-bcx\sqrt{1-c^2x^2}\left(147c^6x^6+15c^4x^4-60c^2x^2+25\right.\right.}{1050x^7\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -(d*Sqrt[d - c^2*d*x^2]*(30*a*(-1 + c^2*x^2)^3*(5 + 2*c^2*x^2) - b*c*x*Sqrt
[1 - c^2*x^2]*(25 - 60*c^2*x^2 + 15*c^4*x^4 + 147*c^6*x^6) + 30*b*(-1 + c^2
*x^2)^3*(5 + 2*c^2*x^2)*ArcSin[c*x]))/(1050*x^7*(-1 + c^2*x^2)) + (2*b*c^7*
d*Sqrt[d - c^2*d*x^2]*Log[x])/(35*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.361, size = 3383, normalized size = 14.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x)
```

```
[Out] -2/35*a*c^2/d/x^5*(-c^2*d*x^2+d)^(5/2)-44/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(3
5*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^4/(c^2*x^2-
1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^11+6*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c
^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^2/(c^2*x^2-1)*
arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9+2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*
x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^8/(c^2*x^2-1)*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c^15+4*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^1
0-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^6/(c^2*x^2-1)*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^13-2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-3
5*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^10/(c^2*x^2-1)*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*c^17-55/14*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-3
5*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^4/(c^2*x^2-1)*c^3*(-c^2*
x^2+1)^(1/2)-170/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c
^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+25/42*b*
(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-10
5*c^2*x^2+25)/x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/2*b*(-d*(c^2*x^2-1))^(
1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^8/
(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^15+9/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c
^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(c^2*x^2-1)
*c^18+1/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6
+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*c^16-142/105*I*b*(-d*(c^2*x^2-
1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)
*x^7/(c^2*x^2-1)*c^14+72/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c
^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^5/(c^2*x^2-1)*c^12-25/21*I*
b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-
105*c^2*x^2+25)*x^3/(c^2*x^2-1)*c^10+5/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*
c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x/(c^2*x^2-1)*c
^8+4*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^7*d/(35*c^
2*x^2-35)-2/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6
*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^13/(c^2*x^2-1)*c^20-2*b*(-d*(c^2*x^2-1))
^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^
11/(c^2*x^2-1)*arcsin(c*x)*c^18+3*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-
35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*arcsin(c*
x)*c^16+12*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+1
54*c^4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^14-5/2*b*(-d*(c^2*
x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2
+25)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13-164/5*b*(-d*(c^2*x^2-1))^(1/2)
*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^5/(c^2
*x^2-1)*arcsin(c*x)*c^12+11/6*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c
^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^
(1/2)*c^11+52/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*
x^6+154*c^4*x^4-105*c^2*x^2+25)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^10+161/30*b*(
-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105
*c^2*x^2+25)*x^2/(c^2*x^2-1)*c^9*(-c^2*x^2+1)^(1/2)+1966/35*b*(-d*(c^2*x^2-
1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)
*x/(c^2*x^2-1)*arcsin(c*x)*c^8-3272/35*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*
x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x/(c^2*x^2-1)*arcsin
(c*x)*c^6+421/42*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6
*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^2/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)+472
/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x
^4-105*c^2*x^2+25)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^4-10/7*I*b*(-d*(c^2*x^2-1)
```

```
)^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/(
c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-2/35*I*b*(-d*(c^2*x^2-1))^(1/
2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(
c^2*x^2-1)*(-c^2*x^2+1)*c^18+1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10
-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*(-c^2*x^
2+1)*c^16+26/105*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c
^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^14-116/10
5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*
x^4-105*c^2*x^2+25)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^12+20/21*I*b*(-d*(c^2*x^
2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+2
5)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^10-5/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*
c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x/(c^2*x^2-1)*(
-c^2*x^2+1)*c^8-1/7*a/d/x^7*(-c^2*d*x^2+d)^(5/2)+25/7*b*(-d*(c^2*x^2-1))^(1
/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^7/(
c^2*x^2-1)*arcsin(c*x)-2/35*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^
2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^7*d-359/30*b*(-d*(c^2*x^2-1))
^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/(c
^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.57653, size = 1296, normalized size = 5.61

$$\left[\frac{6\left(bc^9dx^9 - bc^7dx^7\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) + \left(3\,bc^5dx^5 - \left(3\,bc^5 - 12\,bc^3 + 5\,bc\right)dx^7 - 12\,b \cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/210*(6*(b*c^9*d*x^9 - b*c^7*d*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 -
d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2
*x^4 - x^2)) + (3*b*c^5*d*x^5 - (3*b*c^5 - 12*b*c^3 + 5*b*c)*d*x^7 - 12*b*c
^3*d*x^3 + 5*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(2*a*c^8*
d*x^8 - a*c^6*d*x^6 - 9*a*c^4*d*x^4 + 13*a*c^2*d*x^2 - 5*a*d + (2*b*c^8*d*x
^8 - b*c^6*d*x^6 - 9*b*c^4*d*x^4 + 13*b*c^2*d*x^2 - 5*b*d)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d))/(c^2*x^9 - x^7), 1/210*(12*(b*c^9*d*x^9 - b*c^7*d*x^7)*s
qrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(
c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (3*b*c^5*d*x^5 - (3*b*c^5 - 12*b*c^3 +
5*b*c)*d*x^7 - 12*b*c^3*d*x^3 + 5*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x
^2 + 1) - 6*(2*a*c^8*d*x^8 - a*c^6*d*x^6 - 9*a*c^4*d*x^4 + 13*a*c^2*d*x^2 -
 5*a*d + (2*b*c^8*d*x^8 - b*c^6*d*x^6 - 9*b*c^4*d*x^4 + 13*b*c^2*d*x^2 - 5*
b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^8, x)
```

3.75 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^{10}}\,dx$

Optimal. Leaf size=308

$$-\frac{8c^4\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{315dx^5}-\frac{4c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{63dx^7}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9}-\frac{2bc^7d}{315x^2}$$

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(72*x^8*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(189*x^6*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])/
(420*x^4*Sqrt[1 - c^2*x^2]) - (2*b*c^7*d*Sqrt[d - c^2*d*x^2])/(315*x^2*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(9*d*x^9) - (4
*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (8*c^4*(d - c^
2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(315*d*x^5) + (8*b*c^9*d*Sqrt[d - c^2*d
*x^2]*Log[x])/(315*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.213051, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {271, 264, 4691, 12, 1251, 893}

$$-\frac{8c^4\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{315dx^5}-\frac{4c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{63dx^7}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9}-\frac{2bc^7d}{315x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(72*x^8*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(189*x^6*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])/
(420*x^4*Sqrt[1 - c^2*x^2]) - (2*b*c^7*d*Sqrt[d - c^2*d*x^2])/(315*x^2*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(9*d*x^9) - (4
*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (8*c^4*(d - c^
2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(315*d*x^5) + (8*b*c^9*d*Sqrt[d - c^2*d
*x^2]*Log[x])/(315*Sqrt[1 - c^2*x^2])
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
```

```
(IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^{10}}\,dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2\left(-35-20c^2x^2-8c^4x^4\right)}{315x^9}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int \frac{\left(d-c^2dx\right.}{x^{10}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2\left(-35-20c^2x^2-8c^4x^4\right)}{x^9}\,d}{315\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{4c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{63dx^7} - \frac{\left(bcd\sqrt{\right.}}{}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{4c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{63dx^7} - \frac{8c^4\left(d\right.}{}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{72x^8\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{420x^4\sqrt{1-c^2x^2}} - \frac{2bc^7d\sqrt{d-c^2dx^2}}{315x^2\sqrt{1-c^2x^2}} - \frac{(}{}$$

Mathematica [A] time = 0.257498, size = 197, normalized size = 0.64

$$\frac{8bc^9d\log(x)\sqrt{d-c^2dx^2}}{315\sqrt{1-c^2x^2}} - \frac{d\sqrt{d-c^2dx^2}\left(840a\left(8c^4x^4+20c^2x^2+35\right)\left(c^2x^2-1\right)^3 - bcx\sqrt{1-c^2x^2}\left(18264c^8x^8+1680c^6x^6\right.\right.}{264600x^9\left(c^2x^2\right.}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -(d*Sqrt[d - c^2*d*x^2]*(840*a*(-1 + c^2*x^2)^3*(35 + 20*c^2*x^2 + 8*c^4*x^
4) - b*c*x*Sqrt[1 - c^2*x^2]*(3675 - 7000*c^2*x^2 + 630*c^4*x^4 + 1680*c^6*
x^6 + 18264*c^8*x^8) + 840*b*(-1 + c^2*x^2)^3*(35 + 20*c^2*x^2 + 8*c^4*x^4)
*ArcSin[c*x]))/(264600*x^9*(-1 + c^2*x^2)) + (8*b*c^9*d*Sqrt[d - c^2*d*x^2]
```

```
*Log[x])/(315*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.457, size = 4560, normalized size = 14.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x)
```

```
[Out] -4/63*a*c^2/d/x^7*(-c^2*d*x^2+d)^(5/2)+113594/63*b*(-d*(c^2*x^2-1))^(1/2)*d
/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^
2*x^2+1225)/x/(c^2*x^2-1)*arcsin(c*x)*c^8-25915/126*b*(-d*(c^2*x^2-1))^(1/2
)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725
*c^2*x^2+1225)/x^2/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)-174520/63*b*(-d*(c^2*
x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*
c^4*x^4-4725*c^2*x^2+1225)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+1285/6*b*(-d*(c^
2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+621
0*c^4*x^4-4725*c^2*x^2+1225)/x^4/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)-64/3*b*
(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*
x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^13/(c^2*x^2-1)*arcsin(c*x)*c^22+104/3
*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c
^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^11/(c^2*x^2-1)*arcsin(c*x)*c^20+92
2/945*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8
-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^11/(c^2*x^2-1)*c^20-2906/94
5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-273
0*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^9/(c^2*x^2-1)*c^18-2069/189*I*b
*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6
*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*c^16+4639/189*I*b*(-d*
(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+
6210*c^4*x^4-4725*c^2*x^2+1225)*x^5/(c^2*x^2-1)*c^14-455/27*I*b*(-d*(c^2*x^
2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^
4*x^4-4725*c^2*x^2+1225)*x^3/(c^2*x^2-1)*c^12+35/9*I*b*(-d*(c^2*x^2-1))^(1/
2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-472
5*c^2*x^2+1225)*x/(c^2*x^2-1)*c^10+16*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+
1)^(1/2)*arcsin(c*x)*c^9*d/(315*c^2*x^2-315)-128/315*I*b*(-d*(c^2*x^2-1))^(
1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4
725*c^2*x^2+1225)*x^17/(c^2*x^2-1)*c^26+16/315*I*b*(-d*(c^2*x^2-1))^(1/2)*d
/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^
2*x^2+1225)*x^15/(c^2*x^2-1)*c^24+344/189*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840
*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2
+1225)*x^13/(c^2*x^2-1)*c^22+19540/9*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x
^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/
x^5/(c^2*x^2-1)*arcsin(c*x)*c^4-21175/216*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c
^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1
225)/x^6/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-7700/9*b*(-d*(c^2*x^2-1))^(1/2)
*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*
c^2*x^2+1225)/x^7/(c^2*x^2-1)*arcsin(c*x)*c^2+1225/72*b*(-d*(c^2*x^2-1))^(1
/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-47
25*c^2*x^2+1225)/x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+16/3*b*(-d*(c^2*x^2-1
))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x
^4-4725*c^2*x^2+1225)*x^10/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^19-212/15*b*(-d
*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6
+6210*c^4*x^4-4725*c^2*x^2+1225)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^18-4*b*(-d*(
c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6
210*c^4*x^4-4725*c^2*x^2+1225)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^17+3151
/15*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-273
```

```
0*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^16-
4189/180*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^
8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)
^(1/2)*c^15-60632/105*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^
10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^5/(c^2*x^2-1)
*arcsin(c*x)*c^14+1187/60*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^1
0*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^4/(c^2*x^
2-1)*(-c^2*x^2+1)^(1/2)*c^13+59884/105*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12
*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225
)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^12+829/56*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c
^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1
225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-43264/63*b*(-d*(c^2*x^2-1))^(1
/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-47
25*c^2*x^2+1225)*x/(c^2*x^2-1)*arcsin(c*x)*c^10-8/315*a*c^4/d/x^5*(-c^2*d*x
^2+d)^(5/2)+24*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+18
9*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^10/(c^2*x^2-1)*arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*c^19-24/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^1
2*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+122
5)*x^8/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^17-1/9*a/d/x^9*(-c^2*d*
x^2+d)^(5/2)+208/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^1
0+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^6/(c^2*x^2-1)*
arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^15-1104/7*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(84
0*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^
2+1225)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^13+120*I*b*(-d*(c^
2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+621
0*c^4*x^4-4725*c^2*x^2+1225)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
*c^11-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^
8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^12/(c^2*x^2-1)*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^21-2189/189*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^1
2*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+122
5)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^14+350/27*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(8
40*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x
^2+1225)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-35/9*I*b*(-d*(c^2*x^2-1))^(1/2)*
d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c
^2*x^2+1225)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^10-280/9*I*b*(-d*(c^2*x^2-1))^(1/
2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-472
5*c^2*x^2+1225)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9+1225/9*b*(-d
*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6
+6210*c^4*x^4-4725*c^2*x^2+1225)/x^9/(c^2*x^2-1)*arcsin(c*x)+30055/504*b*(-
d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^
6+6210*c^4*x^4-4725*c^2*x^2+1225)/(c^2*x^2-1)*c^9*(-c^2*x^2+1)^(1/2)-8/315*
b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2
+1)^(1/2))^2-1)*c^9*d-128/315*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-9
45*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^15/
(c^2*x^2-1)*(-c^2*x^2+1)*c^24-16/45*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*
x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)
*x^13/(c^2*x^2-1)*(-c^2*x^2+1)*c^22+1384/945*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(
840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*
x^2+1225)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^20+2306/945*I*b*(-d*(c^2*x^2-1))^
(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-
4725*c^2*x^2+1225)*x^9/(c^2*x^2-1)*(-c^2*x^2+1)*c^18-40/63*I*b*(-d*(c^2*x^2
-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4
*x^4-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^16
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.65776, size = 1517, normalized size = 4.93

$$\left[\frac{96\left(bc^{11}dx^{11}-bc^{9}dx^{9}\right)\sqrt{d}\log\left(\frac{c^{2}dx^{6}+c^{2}dx^{2}-dx^{4}-\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}\left(x^{4}-1\right)\sqrt{d}-d}{c^{2}x^{4}-x^{2}}\right)+\left(48\,bc^{7}dx^{7}+18\,bc^{5}dx^{5}-\left(48\,bc^{7}+18\,bc\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="fricas"
)
```

```
[Out] [1/7560*(96*(b*c^11*d*x^11 - b*c^9*d*x^9)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^
2 - d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/
(c^2*x^4 - x^2)) + (48*b*c^7*d*x^7 + 18*b*c^5*d*x^5 - (48*b*c^7 + 18*b*c^5
- 200*b*c^3 + 105*b*c)*d*x^9 - 200*b*c^3*d*x^3 + 105*b*c*d*x)*sqrt(-c^2*d*x
^2 + d)*sqrt(-c^2*x^2 + 1) - 24*(8*a*c^10*d*x^10 - 4*a*c^8*d*x^8 - a*c^6*d*
x^6 - 53*a*c^4*d*x^4 + 85*a*c^2*d*x^2 - 35*a*d + (8*b*c^10*d*x^10 - 4*b*c^8
*d*x^8 - b*c^6*d*x^6 - 53*b*c^4*d*x^4 + 85*b*c^2*d*x^2 - 35*b*d)*arcsin(c*x
))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9), 1/7560*(192*(b*c^11*d*x^11 - b*c
^9*d*x^9)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)
*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (48*b*c^7*d*x^7 + 18*b*c^5*d
*x^5 - (48*b*c^7 + 18*b*c^5 - 200*b*c^3 + 105*b*c)*d*x^9 - 200*b*c^3*d*x^3
+ 105*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 24*(8*a*c^10*d*x^1
0 - 4*a*c^8*d*x^8 - a*c^6*d*x^6 - 53*a*c^4*d*x^4 + 85*a*c^2*d*x^2 - 35*a*d
+ (8*b*c^10*d*x^10 - 4*b*c^8*d*x^8 - b*c^6*d*x^6 - 53*b*c^4*d*x^4 + 85*b*c^
2*d*x^2 - 35*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**10,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="giac")

[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^10, x)
```

3.76 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^{12}}\,dx$

Optimal. Leaf size=385

$$-\frac{16c^6\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{1155dx^5}-\frac{8c^4\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{231dx^7}-\frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{33dx^9}-\ldots$$

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(110*x^10*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(66*x^8*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])/(
1386*x^6*Sqrt[1 - c^2*x^2]) - (b*c^7*d*Sqrt[d - c^2*d*x^2])/(770*x^4*Sqrt[1
 - c^2*x^2]) - (4*b*c^9*d*Sqrt[d - c^2*d*x^2])/(1155*x^2*Sqrt[1 - c^2*x^2])
 - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(11*d*x^11) - (2*c^2*(d - c^
2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(33*d*x^9) - (8*c^4*(d - c^2*d*x^2)^(5/
2)*(a + b*ArcSin[c*x]))/(231*d*x^7) - (16*c^6*(d - c^2*d*x^2)^(5/2)*(a + b*
ArcSin[c*x]))/(1155*d*x^5) + (16*b*c^11*d*Sqrt[d - c^2*d*x^2]*Log[x])/(1155
*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.301133, antiderivative size = 385, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {271, 264, 4691, 12, 1799, 1620}

$$-\frac{16c^6\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{1155dx^5}-\frac{8c^4\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{231dx^7}-\frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{33dx^9}-\ldots$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^12,x]
```


```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(110*x^10*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(66*x^8*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])/(
1386*x^6*Sqrt[1 - c^2*x^2]) - (b*c^7*d*Sqrt[d - c^2*d*x^2])/(770*x^4*Sqrt[1
 - c^2*x^2]) - (4*b*c^9*d*Sqrt[d - c^2*d*x^2])/(1155*x^2*Sqrt[1 - c^2*x^2])
 - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(11*d*x^11) - (2*c^2*(d - c^
2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(33*d*x^9) - (8*c^4*(d - c^2*d*x^2)^(5/
2)*(a + b*ArcSin[c*x]))/(231*d*x^7) - (16*c^6*(d - c^2*d*x^2)^(5/2)*(a + b*
ArcSin[c*x]))/(1155*d*x^5) + (16*b*c^11*d*Sqrt[d - c^2*d*x^2]*Log[x])/(1155
*Sqrt[1 - c^2*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
```

```
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^{12}}\,dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2\left(-105-70c^2x^2-40c^4x^4-16c^6x^6\right)}{1155x^{11}}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int \cdots$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2\left(-105-70c^2x^2-40c^4x^4 \cdots\right)}{x^{11}}}{1155\sqrt{1-c^2x^2}} \cdots$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{33dx^9} - \frac{\left(bcd\sqrt{\cdots}\right.}{\cdots} \cdots$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{2c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{33dx^9} - \frac{8c^4\left(d \cdots\right.}{\cdots} \cdots$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} + \frac{bc^3d\sqrt{d-c^2dx^2}}{66x^8\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{1386x^6\sqrt{1-c^2x^2}} - \frac{bc^7d\sqrt{d-c^2dx^2}}{770x^4\sqrt{1-c^2x^2}} - \cdots$$

Mathematica [A] time = 0.240391, size = 221, normalized size = 0.57

$$\frac{16bc^{11}d\log(x)\sqrt{d-c^2dx^2}}{1155\sqrt{1-c^2x^2}} - \frac{d\sqrt{d-c^2dx^2}\left(630a\left(16c^6x^6+40c^4x^4+70c^2x^2+105\right)\left(c^2x^2-1\right)^3 - bcx\sqrt{1-c^2x^2}\left(29524c^{10} \cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] -(d*Sqrt[d - c^2*d*x^2]*(630*a*(-1 + c^2*x^2)^3*(105 + 70*c^2*x^2 + 40*c^4*
x^4 + 16*c^6*x^6) - b*c*x*Sqrt[1 - c^2*x^2]*(6615 - 11025*c^2*x^2 + 525*c^4
*x^4 + 945*c^6*x^6 + 2520*c^8*x^8 + 29524*c^10*x^10) + 630*b*(-1 + c^2*x^2)
^3*(105 + 70*c^2*x^2 + 40*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]))/(727650*x^11*
```

```
(-1 + c^2*x^2)) + (16*b*c^11*d*Sqrt[d - c^2*d*x^2]*Log[x])/(1155*Sqrt[1 - c
^2*x^2])
```

Maple [C] time = 0.598, size = 5881, normalized size = 15.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x)
```

```
[Out] result too large to display
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.96817, size = 1702, normalized size = 4.42

$$\left[\frac{48\left(bc^{13}dx^{13} - bc^{11}dx^{11}\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) + \left(24\,bc^9dx^9 + 9\,bc^7dx^7 - \left(24\,bc^9 + 9\,bc^{7}\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="fricas"
)
```

```
[Out] [1/6930*(48*(b*c^13*d*x^13 - b*c^11*d*x^11)*sqrt(d)*log((c^2*d*x^6 + c^2*d*
x^2 - d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d
)/(c^2*x^4 - x^2)) + (24*b*c^9*d*x^9 + 9*b*c^7*d*x^7 - (24*b*c^9 + 9*b*c^7
+ 5*b*c^5 - 105*b*c^3 + 63*b*c)*d*x^11 + 5*b*c^5*d*x^5 - 105*b*c^3*d*x^3 +
63*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(16*a*c^12*d*x^12 -
 8*a*c^10*d*x^10 - 2*a*c^8*d*x^8 - a*c^6*d*x^6 - 145*a*c^4*d*x^4 + 245*a*c^
2*d*x^2 - 105*a*d + (16*b*c^12*d*x^12 - 8*b*c^10*d*x^10 - 2*b*c^8*d*x^8 - b
*c^6*d*x^6 - 145*b*c^4*d*x^4 + 245*b*c^2*d*x^2 - 105*b*d)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d))/(c^2*x^13 - x^11), 1/6930*(96*(b*c^13*d*x^13 - b*c^11*d*x
^11)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt
(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (24*b*c^9*d*x^9 + 9*b*c^7*d*x^7 -
 (24*b*c^9 + 9*b*c^7 + 5*b*c^5 - 105*b*c^3 + 63*b*c)*d*x^11 + 5*b*c^5*d*x^5
 - 105*b*c^3*d*x^3 + 63*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) -
6*(16*a*c^12*d*x^12 - 8*a*c^10*d*x^10 - 2*a*c^8*d*x^8 - a*c^6*d*x^6 - 145*a
*c^4*d*x^4 + 245*a*c^2*d*x^2 - 105*a*d + (16*b*c^12*d*x^12 - 8*b*c^10*d*x^1
0 - 2*b*c^8*d*x^8 - b*c^6*d*x^6 - 145*b*c^4*d*x^4 + 245*b*c^2*d*x^2 - 105*b
```

```
*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^13 - x^11)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**12,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^12, x)
```

3.77 $\int x^7 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=375

$$\frac{\left(d-c^2dx^2\right)^{11/2}\left(a+b\sin^{-1}(cx)\right)}{11c^8d^4}-\frac{\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{3c^8d^3}+\frac{3\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^8d^2}-\frac{\left(d-c^2dx^2\right)^{5}}{}$$

```
[Out] (16*b*d*x*Sqrt[d - c^2*d*x^2])/(1155*c^7*Sqrt[1 - c^2*x^2]) + (8*b*d*x^3*Sq
rt[d - c^2*d*x^2])/(3465*c^5*Sqrt[1 - c^2*x^2]) + (2*b*d*x^5*Sqrt[d - c^2*d
*x^2])/(1925*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^7*Sqrt[d - c^2*d*x^2])/(1617*c
*Sqrt[1 - c^2*x^2]) - (4*b*c*d*x^9*Sqrt[d - c^2*d*x^2])/(297*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^2]) - ((d - c
^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^8*d) + (3*(d - c^2*d*x^2)^(7/2)*(
a + b*ArcSin[c*x]))/(7*c^8*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcSin[c*x]
))/(3*c^8*d^3) + ((d - c^2*d*x^2)^(11/2)*(a + b*ArcSin[c*x]))/(11*c^8*d^4)
```

Rubi [A] time = 0.293262, antiderivative size = 375, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {266, 43, 4691, 12, 1810}

$$\frac{\left(d-c^2dx^2\right)^{11/2}\left(a+b\sin^{-1}(cx)\right)}{11c^8d^4}-\frac{\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{3c^8d^3}+\frac{3\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^8d^2}-\frac{\left(d-c^2dx^2\right)^{5}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^7*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (16*b*d*x*Sqrt[d - c^2*d*x^2])/(1155*c^7*Sqrt[1 - c^2*x^2]) + (8*b*d*x^3*Sq
rt[d - c^2*d*x^2])/(3465*c^5*Sqrt[1 - c^2*x^2]) + (2*b*d*x^5*Sqrt[d - c^2*d
*x^2])/(1925*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^7*Sqrt[d - c^2*d*x^2])/(1617*c
*Sqrt[1 - c^2*x^2]) - (4*b*c*d*x^9*Sqrt[d - c^2*d*x^2])/(297*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^2]) - ((d - c
^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^8*d) + (3*(d - c^2*d*x^2)^(7/2)*(
a + b*ArcSin[c*x]))/(7*c^8*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcSin[c*x]
))/(3*c^8*d^3) + ((d - c^2*d*x^2)^(11/2)*(a + b*ArcSin[c*x]))/(11*c^8*d^4)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
```

```
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rubi steps

$$\int x^7\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^2\left(-16-40c^2x^2-70c^4x^4-105c^6x^6\right)}{1155c^8}dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx)\right)\int$$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^2\left(-16-40c^2x^2-70c^4x^4-105c^6x^6\right)dx}{1155c^7\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a\right.$$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(-16-8c^2x^2-6c^4x^4-5c^6x^6+140c^8x^8-105c^{10}x^{10}\right)dx}{1155c^7\sqrt{1-c^2x^2}}$$

$$= \frac{16bdx\sqrt{d-c^2dx^2}}{1155c^7\sqrt{1-c^2x^2}}+\frac{8bdx^3\sqrt{d-c^2dx^2}}{3465c^5\sqrt{1-c^2x^2}}+\frac{2bdx^5\sqrt{d-c^2dx^2}}{1925c^3\sqrt{1-c^2x^2}}+\frac{bdx^7\sqrt{d-c^2dx^2}}{1617c\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.18655, size = 174, normalized size = 0.46

$$\frac{d\sqrt{d-c^2dx^2}\left(-3465a\left(105c^6x^6+70c^4x^4+40c^2x^2+16\right)\left(1-c^2x^2\right)^{5/2}+bcx\left(33075c^{10}x^{10}-53900c^8x^8+2475c^6x^6+415\right.\right.}{4002075c^8\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-3465*a*(1 - c^2*x^2)^(5/2)*(16 + 40*c^2*x^2 + 70*c
^4*x^4 + 105*c^6*x^6) + b*c*x*(55440 + 9240*c^2*x^2 + 4158*c^4*x^4 + 2475*c
^6*x^6 - 53900*c^8*x^8 + 33075*c^10*x^10) - 3465*b*(1 - c^2*x^2)^(5/2)*(16
+ 40*c^2*x^2 + 70*c^4*x^4 + 105*c^6*x^6)*ArcSin[c*x]))/(4002075*c^8*Sqrt[1
- c^2*x^2])
```

Maple [C] time = 0.585, size = 1781, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] a*(-1/11*x^6*(-c^2*d*x^2+d)^(5/2)/c^2/d+6/11/c^2*(-1/9*x^4*(-c^2*d*x^2+d)^(
5/2)/c^2/d+4/9/c^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*
```

```
x^2+d)^(5/2))))+b*(-1/247808*(-d*(c^2*x^2-1))^(1/2)*(1+11*I*(-c^2*x^2+1)^(1
/2)*x*c+4096*c^8*x^8-2352*c^6*x^6+620*c^4*x^4-61*c^2*x^2-220*I*(-c^2*x^2+1)
^(1/2)*x^3*c^3+2816*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+1024*x^12*c^12-3328*c^10*x
^10-1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2
816*I*(-c^2*x^2+1)^(1/2)*x^7*c^7)*(I+11*arcsin(c*x))*d/c^8/(c^2*x^2-1)-1/55
296*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1
/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/100352*(-d*
(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+
104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^8/(c^2*x^2
-1)+11/51200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1
)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)
^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/3072*(-d*(c^2*x^2-1))^(
1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(
1/2)*x*c+1)*(I+3*arcsin(c*x))*d/c^8/(c^2*x^2-1)-7/1024*(-d*(c^2*x^2-1))^(1/
2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^8/(c^2*x^2-1)-7
/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c
*x)-I)*d/c^8/(c^2*x^2-1)+1/3072*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1
/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(
c*x))*d/c^8/(c^2*x^2-1)+11/51200*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c
^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/10
0352*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112
*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+1
04*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/c^
8/(c^2*x^2-1)-1/55296*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*
c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x
^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d/c^8/(c^2*x
^2-1)-1/247808*(-d*(c^2*x^2-1))^(1/2)*(1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+
1024*x^12*c^12-2816*I*(-c^2*x^2+1)^(1/2)*x^9*c^9-3328*c^10*x^10+2816*I*(-c^
2*x^2+1)^(1/2)*x^7*c^7+4096*c^8*x^8-1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2352*
c^6*x^6+220*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+620*c^4*x^4-11*I*(-c^2*x^2+1)^(1/2
)*x*c-61*c^2*x^2+1)*(-I+11*arcsin(c*x))*d/c^8/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.9603, size = 613, normalized size = 1.63

$$-\frac{\left(33075\,bc^{11}dx^{11} - 53900\,bc^{9}dx^{9} + 2475\,bc^{7}dx^{7} + 4158\,bc^{5}dx^{5} + 9240\,bc^{3}dx^{3} + 55440\,bcdx\right)\sqrt{-c^{2}dx^{2} + d}\sqrt{-c^{2}x^{2} + 1}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/4002075*((33075*b*c^11*d*x^11 - 53900*b*c^9*d*x^9 + 2475*b*c^7*d*x^7 + 4
158*b*c^5*d*x^5 + 9240*b*c^3*d*x^3 + 55440*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sq
rt(-c^2*x^2 + 1) + 3465*(105*a*c^12*d*x^12 - 245*a*c^10*d*x^10 + 145*a*c^8*
d*x^8 + a*c^6*d*x^6 + 2*a*c^4*d*x^4 + 8*a*c^2*d*x^2 - 16*a*d + (105*b*c^12*
d*x^12 - 245*b*c^10*d*x^10 + 145*b*c^8*d*x^8 + b*c^6*d*x^6 + 2*b*c^4*d*x^4
+ 8*b*c^2*d*x^2 - 16*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^10*x^2 - c^
8)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}} (b \arcsin(cx) + a)x^7 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^7, x)
```

3.78 $\int x^5 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=301

$$-\frac{\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{9c^6d^3}+\frac{2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^6d^2}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^6d}+\frac{bc^3dx^9\sqrt{d-}}{81\sqrt{1-c}}$$

```
[Out] (8*b*d*x*Sqrt[d - c^2*d*x^2])/(315*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d*x^3*Sqrt
[d - c^2*d*x^2])/(945*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^5*Sqrt[d - c^2*d*x^2]
)/(525*c*Sqrt[1 - c^2*x^2]) - (10*b*c*d*x^7*Sqrt[d - c^2*d*x^2])/(441*Sqrt[
1 - c^2*x^2]) + (b*c^3*d*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^2]) -
((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d) + (2*(d - c^2*d*x^2)^
(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcS
in[c*x]))/(9*c^6*d^3)
```

Rubi [A] time = 0.237526, antiderivative size = 301, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {266, 43, 4691, 12, 1153}

$$-\frac{\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{9c^6d^3}+\frac{2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^6d^2}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^6d}+\frac{bc^3dx^9\sqrt{d-}}{81\sqrt{1-c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (8*b*d*x*Sqrt[d - c^2*d*x^2])/(315*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d*x^3*Sqrt
[d - c^2*d*x^2])/(945*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^5*Sqrt[d - c^2*d*x^2]
)/(525*c*Sqrt[1 - c^2*x^2]) - (10*b*c*d*x^7*Sqrt[d - c^2*d*x^2])/(441*Sqrt[
1 - c^2*x^2]) + (b*c^3*d*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^2]) -
((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d) + (2*(d - c^2*d*x^2)^
(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcS
in[c*x]))/(9*c^6*d^3)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rubi steps

$$\int x^5 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2\left(-8-20c^2x^2-35c^4x^4\right)}{315c^6} dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int x^5 \left(d-\right.$$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^2\left(-8-20c^2x^2-35c^4x^4\right) dx}{315c^5\sqrt{1-c^2x^2}} + \frac{1}{2}\left(a+b\sin^{-1}(c\right.$$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int \left(-8-4c^2x^2-3c^4x^4+50c^6x^6-35c^8x^8\right) dx}{315c^5\sqrt{1-c^2x^2}} + \frac{1}{2}\left(a+b\sin\right.$$

$$= \frac{8bdx\sqrt{d-c^2dx^2}}{315c^5\sqrt{1-c^2x^2}} + \frac{4bdx^3\sqrt{d-c^2dx^2}}{945c^3\sqrt{1-c^2x^2}} + \frac{bdx^5\sqrt{d-c^2dx^2}}{525c\sqrt{1-c^2x^2}} - \frac{10bcdx^7\sqrt{d-c^2dx}}{441\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.15775, size = 150, normalized size = 0.5

$$\frac{d\sqrt{d-c^2dx^2}\left(-315a\left(35c^4x^4+20c^2x^2+8\right)\left(1-c^2x^2\right)^{5/2}+bcx\left(1225c^8x^8-2250c^6x^6+189c^4x^4+420c^2x^2+2520\right)-315\right.}{99225c^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-315*a*(1 - c^2*x^2)^(5/2)*(8 + 20*c^2*x^2 + 35*c^4
*x^4) + b*c*x*(2520 + 420*c^2*x^2 + 189*c^4*x^4 - 2250*c^6*x^6 + 1225*c^8*x
^8) - 315*b*(1 - c^2*x^2)^(5/2)*(8 + 20*c^2*x^2 + 35*c^4*x^4)*ArcSin[c*x]))
/(99225*c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.41, size = 1327, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] a*(-1/9*x^4*(-c^2*d*x^2+d)^(5/2)/c^2/d+4/9/c^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/
2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2)))+b*(-1/41472*(-d*(c^2*x^2-1))^(1/
2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+
576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c
```

```
^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1
)*(I+9*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^
8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x
^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^
2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^6/(c^2*x^2-1)+1/3200*(-d*(c^2*x^2-1
))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+
20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c
*x))*d/c^6/(c^2*x^2-1)+1/1152*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x
))*d/c^6/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(
1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^6/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*
(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^6/(c^2*x^2-1)+1/11
52*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c
^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^6/(c^2*x^2-1)+1/320
0*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(
-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-
1)*(-I+5*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/25088*(-d*(c^2*x^2-1))^(1/2)*(64*
I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-14
4*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2
)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/41472*(-d*(c^2*x
^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-576*I*(-c^2*x^
2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6
-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41
*c^2*x^2-1)*(-I+9*arcsin(c*x))*d/c^6/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.91501, size = 513, normalized size = 1.7

$$-\frac{\left(1225\,bc^9dx^9 - 2250\,bc^7dx^7 + 189\,bc^5dx^5 + 420\,bc^3dx^3 + 2520\,bcdx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1} + 315\left(35\,ac^{10}dx^{10} - 8\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/99225*((1225*b*c^9*d*x^9 - 2250*b*c^7*d*x^7 + 189*b*c^5*d*x^5 + 420*b*c^
3*d*x^3 + 2520*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 315*(35*a
*c^10*d*x^10 - 85*a*c^8*d*x^8 + 53*a*c^6*d*x^6 + a*c^4*d*x^4 + 4*a*c^2*d*x^
2 - 8*a*d + (35*b*c^10*d*x^10 - 85*b*c^8*d*x^8 + 53*b*c^6*d*x^6 + b*c^4*d*x
^4 + 4*b*c^2*d*x^2 - 8*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c
^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^5, x)
```

3.79 $\int x^3 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=227

$$\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^4d^2}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^4d}+\frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+\frac{bdx^3\sqrt{}}{105c}$$

```
[Out] (2*b*d*x*Sqrt[d - c^2*d*x^2])/(35*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^3*Sqrt[d
- c^2*d*x^2])/(105*c*Sqrt[1 - c^2*x^2]) - (8*b*c*d*x^5*Sqrt[d - c^2*d*x^2])
/(175*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c
^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d) + ((d - c^
2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d^2)
```

Rubi [A] time = 0.199504, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {266, 43, 4691, 12, 373}

$$\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^4d^2}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^4d}+\frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+\frac{bdx^3\sqrt{}}{105c}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*x*Sqrt[d - c^2*d*x^2])/(35*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^3*Sqrt[d
- c^2*d*x^2])/(105*c*Sqrt[1 - c^2*x^2]) - (8*b*c*d*x^5*Sqrt[d - c^2*d*x^2])
/(175*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c
^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d) + ((d - c^
2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 373

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rubi steps

$$\int x^3 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(-2-5c^2x^2\right)\left(1-c^2x^2\right)^2}{35c^4}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int x^3\left(d-c^2dx^2\right)$$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int \left(-2-5c^2x^2\right)\left(1-c^2x^2\right)^2\,dx}{35c^3\sqrt{1-c^2x^2}} + \frac{1}{2}\left(a+b\sin^{-1}(cx)\right)\text{Subst}\Big($$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int \left(-2-c^2x^2+8c^4x^4-5c^6x^6\right)dx}{35c^3\sqrt{1-c^2x^2}} + \frac{1}{2}\left(a+b\sin^{-1}(cx)\right)\text{Sub}$$

$$= \frac{2bdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{bdx^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}} - \frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}} + \frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.129352, size = 126, normalized size = 0.56

$$\frac{d\sqrt{d-c^2dx^2}\left(-105a\left(5c^2x^2+2\right)\left(1-c^2x^2\right)^{5/2} + bcx\left(75c^6x^6-168c^4x^4+35c^2x^2+210\right) - 105b\left(5c^2x^2+2\right)\left(1-c^2x^2\right)^{5/2}\text{s}\right.}{3675c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-105*a*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + b*c*x*
(210 + 35*c^2*x^2 - 168*c^4*x^4 + 75*c^6*x^6) - 105*b*(1 - c^2*x^2)^(5/2)*(
2 + 5*c^2*x^2)*ArcSin[c*x]))/(3675*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.264, size = 931, normalized size = 4.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] a*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+b*(
-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1
/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/
c^4/(c^2*x^2-1)+1/3200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(
-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-
c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/384*(-d*(c^2*
```

```
x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2
*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2
-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^4/(c^2*
x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(a
rcsin(c*x)-I)*d/c^4/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2
+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*a
rcsin(c*x))*d/c^4/(c^2*x^2-1)+1/3200*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2
+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I
*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*d/c^4/(c^2*x^2-1)-
1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-1
12*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3
+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/
c^4/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.93341, size = 427, normalized size = 1.88

$$-\frac{\left(75\,bc^7dx^7 - 168\,bc^5dx^5 + 35\,bc^3dx^3 + 210\,bcdx\right)\sqrt{-c^2dx^2 + d}\sqrt{-c^2x^2 + 1} + 105\left(5\,ac^8dx^8 - 13\,ac^6dx^6 + 9\,ac^4dx^4 + \cdots\right.}{3675\left(c^6x^2 - c^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*((75*b*c^7*d*x^7 - 168*b*c^5*d*x^5 + 35*b*c^3*d*x^3 + 210*b*c*d*x)*
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 105*(5*a*c^8*d*x^8 - 13*a*c^6*d*x
^6 + 9*a*c^4*d*x^4 + a*c^2*d*x^2 - 2*a*d + (5*b*c^8*d*x^8 - 13*b*c^6*d*x^6
+ 9*b*c^4*d*x^4 + b*c^2*d*x^2 - 2*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(
c^6*x^2 - c^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}}(b \arcsin(cx) + a)x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^3, x)
```

3.80 $\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=153

$$-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}$$

```
[Out] (b*d*x*Sqrt[d - c^2*d*x^2])/(5*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d*x^3*Sqrt[d -
 c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^5*Sqrt[d - c^2*d*x^2])/(25
*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

Rubi [A] time = 0.087443, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.08, Rules used = {4677, 194}

$$-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[d - c^2*d*x^2])/(5*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d*x^3*Sqrt[d -
 c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^5*Sqrt[d - c^2*d*x^2])/(25
*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx &= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d}+\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^2\,dx}{5c\sqrt{1-c^2x^2}}\\
&= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d}+\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(1-2c^2x^2+c^4x^4\right)\,dx}{5c\sqrt{1-c^2x^2}}\\
&= \frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d}
\end{aligned}$$

Mathematica [A] time = 0.0558955, size = 84, normalized size = 0.55

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{bc\left(\frac{c^4x^5}{5}-\frac{2c^2x^3}{3}+x\right)}{\sqrt{1-c^2x^2}}-\left(c^2x^2-1\right)^2\left(a+b\sin^{-1}(cx)\right)\right)}{5c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*((b*c*(x - (2*c^2*x^3)/3 + (c^4*x^5)/5))/Sqrt[1 - c^
2*x^2] - (-1 + c^2*x^2)^2*(a + b*ArcSin[c*x])))/(5*c^2)
```

Maple [C] time = 0.175, size = 597, normalized size = 3.9

$$-\frac{a}{5c^2d}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+b\left(-\frac{(i+5\arcsin(cx))d}{800c^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(16c^6x^6-28c^4x^4-16i\sqrt{-c^2x^2+1}x^5c^5+13c^2x^2+20i\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/5*a/c^2/d*(-c^2*d*x^2+d)^(5/2)+b*(-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*
x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)
^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d/c^2/(c^2*x
^2-1)+1/96*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/
2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1
)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(
c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)
*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-1)+1/96*(-d*(c^2*x^2-1))^(1/
2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c
^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/800*(-d*(c^2*x^2-1))^(1/2)
*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^
3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*d/
c^2/(c^2*x^2-1))
```

Maxima [A] time = 1.57588, size = 117, normalized size = 0.76

$$-\frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}b\arcsin(cx)}{5c^2d}-\frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}a}{5c^2d}+\frac{\left(3c^4d^{\frac{5}{2}}x^5-10c^2d^{\frac{5}{2}}x^3+15d^{\frac{5}{2}}x\right)b}{75cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/5*(-c^2*d*x^2 + d)^(5/2)*b*arcsin(c*x)/(c^2*d) - 1/5*(-c^2*d*x^2 + d)^(5
/2)*a/(c^2*d) + 1/75*(3*c^4*d^(5/2)*x^5 - 10*c^2*d^(5/2)*x^3 + 15*d^(5/2)*x
)*b/(c*d)
```

Fricas [A] time = 2.27427, size = 344, normalized size = 2.25

$$-\frac{\left(3\,bc^5dx^5 - 10\,bc^3dx^3 + 15\,bcdx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1} + 15\left(ac^6dx^6 - 3\,ac^4dx^4 + 3\,ac^2dx^2 - ad + \left(bc^6dx^6 - 3\,bc^4\right.\right.}{75\left(c^4x^2-c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/75*((3*b*c^5*d*x^5 - 10*b*c^3*d*x^3 + 15*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*s
qrt(-c^2*x^2 + 1) + 15*(a*c^6*d*x^6 - 3*a*c^4*d*x^4 + 3*a*c^2*d*x^2 - a*d +
 (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2
*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x, x)
```

3.81 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=278

$$\frac{ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{1}{3}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+d$$

```
[Out] (-4*b*c*d*x*Sqrt[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^3*Sqrt[
d - c^2*d*x^2])/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]) + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 - (2*d*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] +
(I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2
] - (I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2]
```

Rubi [A] time = 0.326623, antiderivative size = 278, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4699, 4697, 4709, 4183, 2279, 2391, 8}

$$\frac{ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{1}{3}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+d$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x,x]
```


```
[Out] (-4*b*c*d*x*Sqrt[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^3*Sqrt[
d - c^2*d*x^2])/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]) + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 - (2*d*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] +
(I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2
] - (I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2]
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x}\,dx=\frac{1}{3}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+d\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}\,dx-$$

$$=-\frac{bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}$$

$$=-\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}$$

$$=-\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}$$

$$=-\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}$$

$$=-\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}$$

Mathematica [A] time = 1.07669, size = 278, normalized size = 1.

$$\frac{bd\sqrt{d-c^2dx^2}\left(i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\sin^{-1}(cx)-cx+\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right.\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -(a*d*(-4 + c^2*x^2)*Sqrt[d - c^2*d*x^2])/3 + a*d^(3/2)*Log[x] - a*d^(3/2)*
Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d*Sqrt[d - c^2*d*x^2]*(-(c*x) + S
qrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Arc
Sin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*
PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b*d*Sqrt[d - c^2*d*x^2
]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin[3
*ArcSin[c*x]]))/(36*Sqrt[1 - c^2*x^2])
```

Maple [A] time = 0.187, size = 525, normalized size = 1.9

$$\frac{a}{3}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-ad^{\frac{3}{2}}\ln\left(\frac{1}{x}\left(2d+2\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)+a\sqrt{-c^2dx^2+d}d-\frac{ibd}{c^2x^2-1}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}\text{polylog}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x)
```

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*a-a*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2)
)/x)+a*(-c^2*d*x^2+d)^(1/2)*d-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/(c^2*x^2-1)*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+I*b*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/
3*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4+5/3*b*(-d*(c^2
*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2-1/9*b*(-d*(c^2*x^2-1))^(1/
2)*d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3*c^3+4/3*b*(-d*(c^2*x^2-1))^(1/2)*d/
(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1
/2)/(c^2*x^2-1)*d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^
2+1)^(1/2))-4/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(ac^2dx^2-ad+\left(bc^2dx^2-bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x, x)
```

3.82 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=297

$$-\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.$$

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(2*x*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x*Sqrt[d -
c^2*d*x^2])/Sqrt[1 - c^2*x^2] - (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (3*c^2*d*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 -
 c^2*x^2] - (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[
c*x])])/Sqrt[1 - c^2*x^2] + (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[
2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.330104, antiderivative size = 297, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4695, 4697, 4709, 4183, 2279, 2391, 8, 14}

$$-\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^3,x]
```


```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(2*x*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x*Sqrt[d -
c^2*d*x^2])/Sqrt[1 - c^2*x^2] - (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (3*c^2*d*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 -
 c^2*x^2] - (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[
c*x])])/Sqrt[1 - c^2*x^2] + (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[
2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}-\frac{1}{2}\left(3c^2d\right)\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}$$

$$= -\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{2x^2}+$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-$$

Mathematica [A] time = 2.09342, size = 389, normalized size = 1.31

$$\frac{bc^2d^2\sqrt{1-c^2x^2}\left(-4i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+4i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-4\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right)+4\sin^{-1}(cx)\log\right.}{8\sqrt{d}\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(a*d*(1 + 2*c^2*x^2)*Sqrt[d - c^2*d*x^2])/(2*x^2) - (3*a*c^2*d^(3/2)*Log[x
])/2 + (3*a*c^2*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/2 + (b*c^2*d*
Sqrt[d - c^2*d*x^2]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*Log[
1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - I*PolyLog
[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^
2] + (b*c^2*d^2*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[
ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]
*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*
PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[Ar
cSin[c*x]/2]))/(8*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.227, size = 574, normalized size = 1.9

$$-\frac{a}{2\,dx^2}\left(-c^2dx^2+d\right)^{\frac{5}{2}}-\frac{ac^2}{2}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{3\,ac^2}{2}d^{\frac{3}{2}}\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)-\frac{3\,ac^2d}{2}\sqrt{-c^2dx^2+d}-\frac{bc^4d\,\text{arcs}\cdots}{c^2x\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(5/2)-1/2*a*c^2*(-c^2*d*x^2+d)^(3/2)+3/2*a*c^2*
d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-3/2*a*c^2*(-c^2*d*x^2+d)
^(1/2)*d-b*(-d*(c^2*x^2-1))^(1/2)*c^4*d/(c^2*x^2-1)*arcsin(c*x)*x^2-b*(-d*(
c^2*x^2-1))^(1/2)*c^3*d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+1/2*b*(-d*(c^2*x^2
-1))^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)+1/2*b*d*(-d*(c^2*x^2-1))^(1/2)/x/(
c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/2*b*d*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2
-1)*arcsin(c*x)-3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*
x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3*b*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1
)^(1/2))+3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2
)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(ac^2dx^2 - ad + \left(bc^2dx^2 - bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^3, x)
```

3.83 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{x^5}\,dx$

Optimal. Leaf size=307

$$\frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{3c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{8x^2}$$

```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(12*x^3*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x]))/(8*x^2) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4*x^
4) - (3*c^4*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c
*x])])/(4*Sqrt[1 - c^2*x^2]) + (((3*I)/8)*b*c^4*d*Sqrt[d - c^2*d*x^2]*PolyL
og[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((3*I)/8)*b*c^4*d*Sqrt[d -
c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.32404, antiderivative size = 307, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4695, 4693, 30, 4709, 4183, 2279, 2391, 14}

$$\frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{3c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{8x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^5,x]
```


```
[Out] -(b*c*d*Sqrt[d - c^2*d*x^2])/(12*x^3*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x]))/(8*x^2) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4*x^
4) - (3*c^4*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c
*x])])/(4*Sqrt[1 - c^2*x^2]) + (((3*I)/8)*b*c^4*d*Sqrt[d - c^2*d*x^2]*PolyL
og[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((3*I)/8)*b*c^4*d*Sqrt[d -
c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^5}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} - \frac{1}{4}\left(3c^2d\right)\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x^3}$$

$$= \frac{3c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8x^2} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{\left(bcd\sqrt{\right.}}{}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8x^2} - $$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8x^2} - $$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8x^2} - $$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8x^2} - $$

Mathematica [A] time = 5.753, size = 494, normalized size = 1.61

$$-\frac{bc^4d^2\sqrt{1-c^2x^2}\left(-4i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+4i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-4\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right)+4\sin^{-1}(cx)\right.}{8\sqrt{d}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*d*(-2 + 5*c^2*x^2)*Sqrt[d - c^2*d*x^2])/(8*x^4) + (3*a*c^4*d^(3/2)*Log[x
])/8 - (3*a*c^4*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/8 - (b*c^4*d^
2*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]
^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*
ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(
I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))
/(8*Sqrt[d - c^2*d*x^2]) + (b*c^4*d*Sqrt[d - c^2*d*x^2]*(8*Cot[ArcSin[c*x]/
2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - c*x*Csc[ArcSin[c*x]/2]^4 - 3*ArcS
in[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] +
24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (24*I)*PolyLog[2, -E^(I*ArcSin[
c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin[c*x])] - 6*ArcSin[c*x]*Sec[ArcSin[c*
x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^4 - (16*Sin[ArcSin[c*x]/2]^4)/(c
^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.273, size = 601, normalized size = 2.

$$-\frac{a}{4\,dx^4}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+\frac{ac^2}{8\,dx^2}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+\frac{ac^4}{8}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-\frac{3\,ac^4}{8}d^{\frac{3}{2}}\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)+\frac{3\,ac^4d}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(5/2)+1/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(5/2)+1/8*
a*c^4*(-c^2*d*x^2+d)^(3/2)-3/8*a*c^4*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+
d)^(1/2))/x)+3/8*a*c^4*(-c^2*d*x^2+d)^(1/2)*d+5/8*b*d*(-d*(c^2*x^2-1))^(1/2
)/(c^2*x^2-1)*arcsin(c*x)*c^4-5/8*b*d*(-d*(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*
(-c^2*x^2+1)^(1/2)*c^3-7/8*b*d*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)*arcsi
n(c*x)*c^2+1/12*b*d*(-d*(c^2*x^2-1))^(1/2)/x^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*c+1/4*b*d*(-d*(c^2*x^2-1))^(1/2)/x^4/(c^2*x^2-1)*arcsin(c*x)+3*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4*d/(8*c^2*x^2-8)*arcsin(c*x)*ln(1+I*c
*x+(-c^2*x^2+1)^(1/2))-3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4*d/
(8*c^2*x^2-8)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*b*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4*d/(8*c^2*x^2-8)*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4*d/(8*c^2*x^
2-8)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(ac^2dx^2 - ad + \left(bc^2dx^2 - bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^5, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)}{x^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)/x^5, x)
```

3.84 $\int x^4 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=430

$$\frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{128c^2}-\frac{3d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{256c^4}+\frac{3d^2\sqrt{d-}}{5}$$

```
[Out] (3*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(512*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^4*
Sqrt[d - c^2*d*x^2])/(512*c*Sqrt[1 - c^2*x^2]) - (31*b*c*d^2*x^6*Sqrt[d - c
^2*d*x^2])/(960*Sqrt[1 - c^2*x^2]) + (21*b*c^3*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(640*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^10*Sqrt[d - c^2*d*x^2])/(100*Sqrt[1
 - c^2*x^2]) - (3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(256*c^4)
- (d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^2) + (d^2*x^5*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/32 + (d*x^5*(d - c^2*d*x^2)^(3/2)*(a
 + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/10
+ (3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(512*b*c^5*Sqrt[1 - c^2
*x^2])
```

Rubi [A] time = 0.553045, antiderivative size = 430, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4699, 4697, 4707, 4641, 30, 14, 266, 43}

$$\frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{128c^2}-\frac{3d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{256c^4}+\frac{3d^2\sqrt{d-}}{5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (3*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(512*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^4*
Sqrt[d - c^2*d*x^2])/(512*c*Sqrt[1 - c^2*x^2]) - (31*b*c*d^2*x^6*Sqrt[d - c
^2*d*x^2])/(960*Sqrt[1 - c^2*x^2]) + (21*b*c^3*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(640*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^10*Sqrt[d - c^2*d*x^2])/(100*Sqrt[1
 - c^2*x^2]) - (3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(256*c^4)
- (d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^2) + (d^2*x^5*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/32 + (d*x^5*(d - c^2*d*x^2)^(3/2)*(a
 + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/10
+ (3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(512*b*c^5*Sqrt[1 - c^2
*x^2])
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
```

```
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int x^4 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{10}x^5 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) + \frac{1}{2}d \int x^4 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx\right.$$

$$= \frac{1}{16}dx^5 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) + \frac{1}{10}x^5 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{1}{32}d^2x^5\sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx)\right) + \frac{1}{16}dx^5 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) -$$

$$= -\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}} + \frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{10}\sqrt{d-c^2dx^2}}{100\sqrt{1-c^2x^2}} - \frac{d^2x^3}{}$$

$$= \frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}} - \frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}} + \frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{10}}{100\sqrt{1}}$$

$$= \frac{3bd^2x^2\sqrt{d-c^2dx^2}}{512c^3\sqrt{1-c^2x^2}} + \frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}} - \frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}} + \frac{21bc^3d^2x^8\sqrt{d}}{640\sqrt{1-}}$$

Mathematica [A] time = 0.236859, size = 220, normalized size = 0.51

$$\frac{d^2\sqrt{d-c^2dx^2}\left(225a^2+30abcx\sqrt{1-c^2x^2}\left(128c^8x^8-336c^6x^6+248c^4x^4-10c^2x^2-15\right)+30b\sin^{-1}(cx)\left(15a+bcx\sqrt{1-c\right.\right.}{384}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(225*a^2 + b^2*c^2*x^2*(225 + 75*c^2*x^2 - 1240*c^
4*x^4 + 1260*c^6*x^6 - 384*c^8*x^8) + 30*a*b*c*x*Sqrt[1 - c^2*x^2]*(-15 - 1
0*c^2*x^2 + 248*c^4*x^4 - 336*c^6*x^6 + 128*c^8*x^8) + 30*b*(15*a + b*c*x*S
qrt[1 - c^2*x^2]*(-15 - 10*c^2*x^2 + 248*c^4*x^4 - 336*c^6*x^6 + 128*c^8*x^
8))*ArcSin[c*x] + 225*b^2*ArcSin[c*x]^2))/(38400*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [A] time = 0.471, size = 735, normalized size = 1.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/10*a*x^3*(-c^2*d*x^2+d)^(7/2)/c^2/d-3/80*a/c^4*x*(-c^2*d*x^2+d)^(7/2)/d+
1/160*a/c^4*x*(-c^2*d*x^2+d)^(5/2)+1/128*a/c^4*d*x*(-c^2*d*x^2+d)^(3/2)+3/2
56*a/c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)+3/256*a/c^4*d^3/(c^2*d)^(1/2)*arctan((c
^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-3/512*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/100*b*(-d*(c^2*x^2-1))^(1/2)
*d^2*c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^10-21/640*b*(-d*(c^2*x^2-1))^(1/2
)*d^2*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^8+31/960*b*(-d*(c^2*x^2-1))^(1/2
)*d^2*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^6-1/512*b*(-d*(c^2*x^2-1))^(1/2)*d
^2/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-3/512*b*(-d*(c^2*x^2-1))^(1/2)*d^2/
c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+1/10*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^
6/(c^2*x^2-1)*arcsin(c*x)*x^11-29/80*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*
```

```
x^2-1)*arcsin(c*x)*x^9+73/160*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*
arcsin(c*x)*x^7-129/640*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x
)*x^5-1/256*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c^2/(c^2*x^2-1)*arcsin(c*x)*x^3+3/
256*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c^4/(c^2*x^2-1)*arcsin(c*x)*x+101/1228800*
b*(-d*(c^2*x^2-1))^(1/2)*d^2/c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^4d^2x^8 - 2\,ac^2d^2x^6 + ad^2x^4 + \left(bc^4d^2x^8 - 2\,bc^2d^2x^6 + bd^2x^4\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^8 - 2*a*c^2*d^2*x^6 + a*d^2*x^4 + (b*c^4*d^2*x^8 - 2*
b*c^2*d^2*x^6 + b*d^2*x^4)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right) + a)x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^4, x)
```

3.85 $\int x^2 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=351

$$\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{5d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{128c^2}+\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{256bc^3\sqrt{1-c^2x^2}}+\frac{1}{8}x^3\left(d-\right.$$

```
[Out] (5*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(768*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x^6*Sqrt[d
- c^2*d*x^2])/(288*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(64*Sqrt[1 - c^2*x^2]) - (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(128*c^2) + (5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/64 + (5*d*
x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/48 + (x^3*(d - c^2*d*x^2)^(5
/2)*(a + b*ArcSin[c*x]))/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
^2)/(256*b*c^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.472728, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4699, 4697, 4707, 4641, 30, 14, 266, 43}

$$\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{5d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{128c^2}+\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{256bc^3\sqrt{1-c^2x^2}}+\frac{1}{8}x^3\left(d-\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (5*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(768*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x^6*Sqrt[d
- c^2*d*x^2])/(288*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(64*Sqrt[1 - c^2*x^2]) - (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(128*c^2) + (5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/64 + (5*d*
x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/48 + (x^3*(d - c^2*d*x^2)^(5
/2)*(a + b*ArcSin[c*x]))/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
^2)/(256*b*c^3*Sqrt[1 - c^2*x^2])
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
```

```
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}(5d)\int x^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.$$

$$=\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+$$

$$=\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)$$

$$=-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{5d^2x}{}$$

$$=\frac{5bd^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8}{64\sqrt{}}$$

Mathematica [A] time = 0.197845, size = 196, normalized size = 0.56

$$\frac{d^2\sqrt{d-c^2dx^2}\left(45a^2+6abcx\sqrt{1-c^2x^2}\left(48c^6x^6-136c^4x^4+118c^2x^2-15\right)+6b\sin^{-1}(cx)\left(15a+bcx\sqrt{1-c^2x^2}\left(48c^6x^6-\right.\right.\right.}{2304bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(45*a^2 + b^2*c^2*x^2*(45 - 177*c^2*x^2 + 136*c^4*
x^4 - 36*c^6*x^6) + 6*a*b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^
4*x^4 + 48*c^6*x^6) + 6*b*(15*a + b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^
2 - 136*c^4*x^4 + 48*c^6*x^6))*ArcSin[c*x] + 45*b^2*ArcSin[c*x]^2))/(2304*b
*c^3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.313, size = 620, normalized size = 1.8

$$-\frac{ax}{8c^2d}\left(-c^2dx^2+d\right)^{\frac{7}{2}}+\frac{ax}{48c^2}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+\frac{5adx}{192c^2}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{5ad^2x}{128c^2}\sqrt{-c^2dx^2+d}+\frac{5ad^3}{128c^2}\arctan\left(x\sqrt{c^2d}\frac{}{\sqrt{-c}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/8*a*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/48*a/c^2*x*(-c^2*d*x^2+d)^(5/2)+5/192
*a/c^2*d*x*(-c^2*d*x^2+d)^(3/2)+5/128*a/c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/12
8*a/c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/8*
b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)*x^9-23/48*b*(-d*(c
^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)*x^7+127/192*b*(-d*(c^2*x^2
-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*x^5-133/384*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^3+5/128*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c^2
/(c^2*x^2-1)*arcsin(c*x)*x-359/73728*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c^3/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)+1/64*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*x^8-17/288*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*x^6+59/768*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*(
-c^2*x^2+1)^(1/2)*x^4-5/256*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c/(c^2*x^2-1)*(-c^
```

```
2*x^2+1)^(1/2)*x^2-5/256*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c
^2*x^2-1)*arcsin(c*x)^2*d^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^4d^2x^6 - 2\,ac^2d^2x^4 + ad^2x^2 + \left(bc^4d^2x^6 - 2\,bc^2d^2x^4 + bd^2x^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^6 - 2*a*c^2*d^2*x^4 + a*d^2*x^2 + (b*c^4*d^2*x^6 - 2*
b*c^2*d^2*x^4 + b*d^2*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{5}{2}} (b \arcsin\left(cx\right) + a)x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^2, x)
```

3.86 $\int \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=265

$$\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{32bc\sqrt{1-c^2x^2}}+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{5}{24}dx\left(d-\right.$$

```
[Out] (-25*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2
*x^4*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*d^2*(1 - c^2*x^2)^(5/
2)*Sqrt[d - c^2*d*x^2])/(36*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]))/16 + (5*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (x*(d -
 c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/(32*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.156505, antiderivative size = 265, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4649, 4647, 4641, 30, 14, 261}

$$\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{32bc\sqrt{1-c^2x^2}}+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{5}{24}dx\left(d-\right.$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (-25*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2
*x^4*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*d^2*(1 - c^2*x^2)^(5/
2)*Sqrt[d - c^2*d*x^2])/(36*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]))/16 + (5*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (x*(d -
 c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/(32*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
```

```
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)dx = \frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}(5d)\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}x\left(d\right.$$

$$= \frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{5}{24}dx\left(d\right.$$

$$= -\frac{25bcd^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{5bc^3d^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$

Mathematica [A] time = 0.911691, size = 266, normalized size = 1.

$$\frac{d^2\left(\sqrt{d-c^2dx^2}\left(384ac^5x^5\sqrt{1-c^2x^2}-1248ac^3x^3\sqrt{1-c^2x^2}+1584acx\sqrt{1-c^2x^2}+270b\cos\left(2\sin^{-1}(cx)\right)+27b\cos\left(4\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(360*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 - 720*a*Sqrt[d]*Sqrt[1 - c^2*
x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d -
c^2*d*x^2]*(1584*a*c*x*Sqrt[1 - c^2*x^2] - 1248*a*c^3*x^3*Sqrt[1 - c^2*x^2]
 + 384*a*c^5*x^5*Sqrt[1 - c^2*x^2] + 270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*
ArcSin[c*x]] + 2*b*Cos[6*ArcSin[c*x]]) + 12*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*
x]*(45*Sin[2*ArcSin[c*x]] + 9*Sin[4*ArcSin[c*x]] + Sin[6*ArcSin[c*x]])))/(2
304*c*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.186, size = 495, normalized size = 1.9

$$\frac{ax}{6}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+\frac{5\,adx}{24}\left(-c^2dx^2+d\right)^{\frac{3}{2}}+\frac{5\,ad^2x}{16}\sqrt{-c^2dx^2+d}+\frac{5\,ad^3}{16}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{5\,b\,(\mathrm{ar}}{32\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/6*a*x*(-c^2*d*x^2+d)^(5/2)+5/24*a*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a*d^2*x*(
-c^2*d*x^2+d)^(1/2)+5/16*a*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2))-5/32*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-
1)*arcsin(c*x)^2*d^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsi
n(c*x)*x^7-17/24*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)*x
^5+59/48*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*x^3-299/2
304*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-11/16*b*(
-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x+1/36*b*(-d*(c^2*x^2-1))
^(1/2)*d^2*c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^6-13/96*b*(-d*(c^2*x^2-1))^
(1/2)*d^2*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4+11/32*b*(-d*(c^2*x^2-1))^(
1/2)*d^2*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

<u>**Giac**</u> **[F]** time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a), x)
```

3.87 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=268

$$-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{15cd^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{16b\sqrt{1-c^2x^2}}-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{(}{}$$

```
[Out] (9*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (15*c^2*d^2*x*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x]))/8 - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/4 - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x - (15*c*d^2*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*Sqrt[1 - c^2*x^2]) + (b*c*d
^2*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.239901, antiderivative size = 268, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4695, 4649, 4647, 4641, 30, 14, 266, 43}

$$-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{15cd^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{16b\sqrt{1-c^2x^2}}-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{(}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^2,x]
```


```
[Out] (9*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (15*c^2*d^2*x*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x]))/8 - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/4 - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x - (15*c*d^2*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*Sqrt[1 - c^2*x^2]) + (b*c*d
^2*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x} - \left(5c^2d\right)\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x} - \frac{1}{4}$$

$$= -\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.$$

$$= \frac{9bc^3d^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.$$

Mathematica [A] time = 0.887622, size = 257, normalized size = 0.96

$$d^2\left(\sqrt{d-c^2dx^2}\left(16\left(a\sqrt{1-c^2x^2}\left(2c^4x^4-9c^2x^2-8\right)+8bcx\log(cx)\right)-32bcx\cos\left(2\sin^{-1}(cx)\right)-bcx\cos\left(4\sin^{-1}(cx)\right)\right)\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (d^2*(-120*b*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 + 240*a*c*Sqrt[d]*x*Sqrt
[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] +
Sqrt[d - c^2*d*x^2]*(-32*b*c*x*Cos[2*ArcSin[c*x]] - b*c*x*Cos[4*ArcSin[c*x]
] + 16*(a*Sqrt[1 - c^2*x^2]*(-8 - 9*c^2*x^2 + 2*c^4*x^4) + 8*b*c*x*Log[c*x]
)) - 4*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(32*Sqrt[1 - c^2*x^2] + 16*c*x*Sin
[2*ArcSin[c*x]] + c*x*Sin[4*ArcSin[c*x]])))/(128*x*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.25, size = 593, normalized size = 2.2

$$-\frac{a}{dx}\left(-c^2dx^2+d\right)^{\frac{7}{2}}-ac^2x\left(-c^2dx^2+d\right)^{\frac{5}{2}}-\frac{5\,ac^2dx}{4}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-\frac{15\,ac^2d^2x}{8}\sqrt{-c^2dx^2+d}-\frac{15\,ac^2d^3}{8}\arctan\left(x\sqrt{c^2d}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(7/2)-a*c^2*x*(-c^2*d*x^2+d)^(5/2)-5/4*a*c^2*d*x*(-c^
2*d*x^2+d)^(3/2)-15/8*a*c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)-15/8*a*c^2*d^3/(c^2*
d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+15/16*b*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c*d^2+I*b*(-c^2*x^2+
1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c*d^2+b*(-d*(c^2*x^
2-1))^(1/2)*arcsin(c*x)*d^2/(c^2*x^2-1)/x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c*d^2+1/4*b*(-d*(
c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)*x^5-11/8*b*(-d*(c^2*x^2-1
))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)*x^3+1/8*b*(-d*(c^2*x^2-1))^(1/2)*c
^2*d^2/(c^2*x^2-1)*arcsin(c*x)*x+33/128*b*(-d*(c^2*x^2-1))^(1/2)*c*d^2/(c^2
*x^2-1)*(-c^2*x^2+1)^(1/2)+1/16*b*(-d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1
)*(-c^2*x^2+1)^(1/2)*x^4-9/16*b*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)*
(-c^2*x^2+1)^(1/2)*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^4d^2x^4-2\,ac^2d^2x^2+ad^2+\left(bc^4d^2x^4-2\,bc^2d^2x^2+bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^2, x)
```

3.88 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^4}\,dx$

Optimal. Leaf size=277

$$\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{5c^3d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4b\sqrt{1-c^2x^2}}+\frac{5c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x}-\frac{(d-}{}$$

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(6*x^2*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^2*S
qrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/2 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x
]))/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(3*x^3) + (5*c^3*d^
2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 - c^2*x^2]) - (7*b
*c^3*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.304384, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4695, 4647, 4641, 30, 14, 266, 43}

$$\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{5c^3d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4b\sqrt{1-c^2x^2}}+\frac{5c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x}-\frac{(d-}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^4,x]
```


```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(6*x^2*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^2*S
qrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/2 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x
]))/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(3*x^3) + (5*c^3*d^
2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 - c^2*x^2]) - (7*b
*c^3*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3} - \frac{1}{3}\left(5c^2d\right)\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{x^2}$$

$$= \frac{5c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x} - \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3} + \left(5c^4\right.$$

$$= \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) + \frac{5c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x} -$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.$$

Mathematica [A] time = 1.51381, size = 243, normalized size = 0.88

$$\frac{1}{24}d^2\left(\frac{\sqrt{d-c^2dx^2}\left(4a\sqrt{1-c^2x^2}\left(3c^4x^4+14c^2x^2-2\right)+b\left(-6c^5x^5+3c^3x^3-4cx\right)-56bc^3x^3\log(cx)\right)}{x^3\sqrt{1-c^2x^2}} - 60ac^3\sqrt{d}\tan^{-}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (d^2*((4*b*Sqrt[d - c^2*d*x^2]*(-2 + 14*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x])/x
^3 + (30*b*c^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 60*a*
```

```
c^3*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + (S
qrt[d - c^2*d*x^2]*(4*a*Sqrt[1 - c^2*x^2]*(-2 + 14*c^2*x^2 + 3*c^4*x^4) + b
*(-4*c*x + 3*c^3*x^3 - 6*c^5*x^5) - 56*b*c^3*x^3*Log[c*x]))/(x^3*Sqrt[1 - c
^2*x^2])))/24
```

Maple [C] time = 0.295, size = 1527, normalized size = 5.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(7/2)+4/3*a*c^4*x*(-c^2*d*x^2+d)^(5/2)+4/3*a*c^
2/d/x*(-c^2*d*x^2+d)^(7/2)-1/8*b*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)-49/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*
x^2+1)*x^5/(c^2*x^2-1)*c^8-203*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*
c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+21/2*b*(-d*(c^2*x^2-1))^(1/2)*d^
2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+190/3*b*
(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c
*x)*c^4-23/3*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*
x^2-1)*arcsin(c*x)*c^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*
x^2+1)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+147*b*(-d*(c^2*x^2-1))^(1/2)*d^
2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8+28/3*I*b*(-d*(c
^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-7/6*I*b*
(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*c^4-14*I
*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*c^3*d^2/(3*c^2*x^2
-3)+1/4*b*(-d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2
-5/4*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*
c^3*d^2+5/3*a*c^4*d*x*(-c^2*d*x^2+d)^(3/2)+5/2*a*c^4*d^2*x*(-c^2*d*x^2+d)^(
1/2)+5/2*a*c^4*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2
))+7/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)
*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3-49/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63
*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+7/6*I*b*(-d*(c^2*x^
2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4+1/
2*b*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)*x^3-1/2*b*(-d*(c
^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)*x-5/2*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)+7/3*b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+
1)^(1/2))^2-1)*c^3*d^2+1/3*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*
x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+147*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c
^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-35*
I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*ar
csin(c*x)*(-c^2*x^2+1)^(1/2)*c^5
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right) + a\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^4, x)
```

3.89 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^6}\,dx$

Optimal. Leaf size=277

$$-\frac{c^5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2b\sqrt{1-c^2x^2}}-\frac{c^4d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{\left(d-c^2d\right.}{}$$

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(20*x^4*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2*S
qrt[d - c^2*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - (c^4*d^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/x + (c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]
))/(3*x^3) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*x^5) - (c^5*d^2
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (23*b
*c^5*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.354384, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4695, 4693, 29, 4641, 14, 266, 43}

$$-\frac{c^5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2b\sqrt{1-c^2x^2}}-\frac{c^4d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{\left(d-c^2d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^6,x]
```


```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(20*x^4*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2*S
qrt[d - c^2*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - (c^4*d^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/x + (c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]
))/(3*x^3) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*x^5) - (c^5*d^2
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (23*b
*c^5*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^6}\,dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5x^5} - \left(c^2d\right)\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^4}\,d$$

$$= \frac{c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3} - \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{5x^5} + \left(c^4d^2\right.$$

$$= -\frac{c^4d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x} + \frac{c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3} - \left(\right.$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{11bc^3d^2\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{c^4d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x} -$$

Mathematica [A] time = 1.26523, size = 234, normalized size = 0.84

$$\frac{1}{60}d^2\left(\frac{\sqrt{d-c^2dx^2}\left(-4a\sqrt{1-c^2x^2}\left(23c^4x^4-11c^2x^2+3\right)+bcx\left(22c^2x^2-3\right)+92bc^5x^5\log(cx)\right)}{x^5\sqrt{1-c^2x^2}} + 60ac^5\sqrt{d}\tan^{-1}\left(\frac{cx}{\sqrt{d}}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] (d^2*((-4*b*Sqrt[d - c^2*d*x^2]*(3 - 11*c^2*x^2 + 23*c^4*x^4)*ArcSin[c*x])/
x^5 - (30*b*c^5*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + 60*a
*c^5*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + (
```

```
Sqrt[d - c^2*d*x^2]*(b*c*x*(-3 + 22*c^2*x^2) - 4*a*Sqrt[1 - c^2*x^2]*(3 - 1
1*c^2*x^2 + 23*c^4*x^4) + 92*b*c^5*x^5*Log[c*x]))/(x^5*Sqrt[1 - c^2*x^2])))
/60
```

Maple [C] time = 0.319, size = 2615, normalized size = 9.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x)
```

```
[Out] 2/15*a*c^2/d/x^3*(-c^2*d*x^2+d)^(7/2)-69/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(
1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/(c^2*x^2-1)*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*c^5-1889/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-7
65*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^2/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)
-9602/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4
-75*c^2*x^2+9)*x/(c^2*x^2-1)*arcsin(c*x)*c^6+69/20*I*b*(-d*(c^2*x^2-1))^(1/
2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x/(c^2*x^2-1)*c^
6+46*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5*d^2/(15*
c^2*x^2-15)+5819/30*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^
6+325*c^4*x^4-75*c^2*x^2+9)*x^9/(c^2*x^2-1)*c^14-18791/60*I*b*(-d*(c^2*x^2-
1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^7/(c^2*
x^2-1)*c^12+943/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+
325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*c^10-207/5*I*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^3/(c^2*x^2-1
)*c^8+3519*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x
^4-75*c^2*x^2+9)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^12-759/2*b*(-d*(c^2*x^2-1))^
(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^6/(c^2*x^2-
1)*(-c^2*x^2+1)^(1/2)*c^11-9595/3*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^
8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^10+13
29/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*
c^2*x^2+9)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9+5318/3*b*(-d*(c^2*x^2-1))
^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^3/(c^2*x^2
-1)*arcsin(c*x)*c^8+777/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^
6*x^6+325*c^4*x^4-75*c^2*x^2+9)/x/(c^2*x^2-1)*arcsin(c*x)*c^4-141/20*b*(-d*
(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/
x^2/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-117/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(
1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/x^3/(c^2*x^2-1)*arcsin(c
*x)*c^2+9/20*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4
*x^4-75*c^2*x^2+9)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-1587*b*(-d*(c^2*x^2
-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^9/(c^2
*x^2-1)*arcsin(c*x)*c^14+9/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765
*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/x^5/(c^2*x^2-1)*arcsin(c*x)-23/15*b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1
/2))^2-1)*c^5*d^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-
1)*arcsin(c*x)^2*c^5*d^2+175/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-7
65*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)+581
9/30*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-7
5*c^2*x^2+9)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-7153/60*I*b*(-d*(c^2*x^2-1))
^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2
-1)*(-c^2*x^2+1)*c^10+759/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-7
65*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^8-69/20
*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^
2*x^2+9)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+1173*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2
/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^6/(c^2*x^2-1)*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c^11-1495/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c
```

```
^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*c^9+115*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c
^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)*c^7-1587*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*
c^4*x^4-75*c^2*x^2+9)*x^8/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^13-8
/15*a*c^4/d/x*(-c^2*d*x^2+d)^(7/2)-2/3*a*c^6*(-c^2*d*x^2+d)^(3/2)*d*x-a*c^6
*d^2*x*(-c^2*d*x^2+d)^(1/2)-a*c^6*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/
(-c^2*d*x^2+d)^(1/2))-1/5*a/d/x^5*(-c^2*d*x^2+d)^(7/2)-8/15*a*c^6*x*(-c^2*d
*x^2+d)^(5/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^6, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right) + a\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^6, x)
```

3.90 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^8}\,dx$

Optimal. Leaf size=203

$$-\frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{7dx^7}-\frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}}+\frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}}-\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}-\frac{bc^7d^2\log(x)\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}$$

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(42*x^6*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*Sq
rt[d - c^2*d*x^2])/(28*x^4*Sqrt[1 - c^2*x^2]) - (3*b*c^5*d^2*Sqrt[d - c^2*d
*x^2])/(14*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*
x]))/(7*d*x^7) - (b*c^7*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(7*Sqrt[1 - c^2*x^2
])
```

Rubi [A] time = 0.125442, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4681, 266, 43}

$$-\frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{7dx^7}-\frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}}+\frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}}-\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}-\frac{bc^7d^2\log(x)\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(42*x^6*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*Sq
rt[d - c^2*d*x^2])/(28*x^4*Sqrt[1 - c^2*x^2]) - (3*b*c^5*d^2*Sqrt[d - c^2*d
*x^2])/(14*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*
x]))/(7*d*x^7) - (b*c^7*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(7*Sqrt[1 - c^2*x^2
])
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^8}dx = -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7} + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^3}{x^7}dx}{7\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7} + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{\left(1-c^2x\right)^3}{x^4}dx, x, x^2\right.}{14\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7} + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{x^4}-\frac{3c^2}{x^3}+\frac{3c^4}{x^2}-\right.\right.}{14\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}} - \frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}} - \frac{\left(d-c^2dx^2\right)^{7/2}\left(a\right.}{7dx^7}$$

Mathematica [A] time = 0.211525, size = 156, normalized size = 0.77

$$\frac{d^2\sqrt{d-c^2dx^2}\left(60a\left(c^2x^2-1\right)^4+bcx\sqrt{1-c^2x^2}\left(-147c^6x^6+90c^4x^4-45c^2x^2+10\right)+60b\left(c^2x^2-1\right)^4\sin^{-1}(cx)\right)}{420x^7\left(c^2x^2-1\right)} - \frac{bc^7d^2\,\mathrm{l}}{7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(60*a*(-1 + c^2*x^2)^4 + b*c*x*Sqrt[1 - c^2*x^2]*(
10 - 45*c^2*x^2 + 90*c^4*x^4 - 147*c^6*x^6) + 60*b*(-1 + c^2*x^2)^4*ArcSin[
c*x]))/(420*x^7*(-1 + c^2*x^2)) - (b*c^7*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(7
*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.36, size = 4031, normalized size = 19.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x)
```

```
[Out] 1/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35
*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^8+1/7*I*b*(-d
*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*
c^4*x^4-7*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-1/7*a/d
/x^7*(-c^2*d*x^2+d)^(7/2)-3/14*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-
21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^11/(c^2*x^2-1)
*(-c^2*x^2+1)*c^18+3/4*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*
x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9/(c^2*x^2-1)*(-c^2*x^
2+1)*c^16-83/84*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35
*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^
14+17/28*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^
8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-5/28
*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6
*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^10+1/7*b*(-d*(c
^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4
*x^4-7*c^2*x^2+1)/x^7/(c^2*x^2-1)*arcsin(c*x)+1/7*b*(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^7*d^2-5
```

```
5/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c
^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)+b*(-d*(c^
2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*
x^4-7*c^2*x^2+1)*x^13/(c^2*x^2-1)*arcsin(c*x)*c^20-7*b*(-d*(c^2*x^2-1))^(1/
2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2
+1)*x^11/(c^2*x^2-1)*arcsin(c*x)*c^18+3/2*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c
^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^10/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^17+23*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x
^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9/(c^2*x^2
-1)*arcsin(c*x)*c^16-21/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10
*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^8/(c^2*x^2-1)*(-c^2*x
^2+1)^(1/2)*c^15-47*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+
35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(c^2*x^2-1)*arcsin(c*x)*c
^14+119/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^
8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^1
3+66*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c
^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^12-47/4*b*(-d*
(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c
^4*x^4-7*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-66*b*(-d*(c^2*x
^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4
-7*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^10+109/12*b*(-d*(c^2*x^2-1))^(1
/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^
2+1)*x^2/(c^2*x^2-1)*c^9*(-c^2*x^2+1)^(1/2)+330/7*b*(-d*(c^2*x^2-1))^(1/2)*
d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)
*x/(c^2*x^2-1)*arcsin(c*x)*c^8-165/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x
^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x/(c^2*x^2-1
)*arcsin(c*x)*c^6+41/28*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x
^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^2/(c^2*x^2-1)*c^5*(-c^2
*x^2+1)^(1/2)+55/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+3
5*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^
4-23/84*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-3
5*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^4/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-11
/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6
*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+1/42*b*(-d*(c^
2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*
x^4-7*c^2*x^2+1)/x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-2*I*b*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^7*d^2/(7*c^2*x^2-7)-3/14*I*b*(-d*(
c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^
4*x^4-7*c^2*x^2+1)*x^13/(c^2*x^2-1)*c^20+27/28*I*b*(-d*(c^2*x^2-1))^(1/2)*d
^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*
x^11/(c^2*x^2-1)*c^18-73/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*
c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9/(c^2*x^2-1)*c^1
6+67/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8
-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(c^2*x^2-1)*c^14-11/14*I*b*(-d*(c^2
*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x
^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^12+17/84*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(
7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^3/
(c^2*x^2-1)*c^10-1/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x
^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x/(c^2*x^2-1)*c^8+I*b*(-d
*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*
c^4*x^4-7*c^2*x^2+1)*x^12/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^19-I
*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x
^6+21*c^4*x^4-7*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c
^9-3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35
*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^10/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*c^17+5*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^
8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^8/(c^2*x^2-1)*arcsin(c*x)*(-c^2*
x^2+1)^(1/2)*c^15-5*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^1
0+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^6/(c^2*x^2-1)*arcsin(c*x)
```

```
*(-c^2*x^2+1)^(1/2)*c^13+3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c
^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c^11
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.91641, size = 1368, normalized size = 6.74

$$\left[\frac{6\left(bc^9d^2x^9 - bc^7d^2x^7\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) + \left(18\,bc^5d^2x^5 - \left(18\,bc^5 - 9\,bc^3 + 2\,bc\right)d^2x^7 - 9\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/84*(6*(b*c^9*d^2*x^9 - b*c^7*d^2*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2
 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(
c^2*x^4 - x^2)) + (18*b*c^5*d^2*x^5 - (18*b*c^5 - 9*b*c^3 + 2*b*c)*d^2*x^7
- 9*b*c^3*d^2*x^3 + 2*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) +
12*(a*c^8*d^2*x^8 - 4*a*c^6*d^2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a
*d^2 + (b*c^8*d^2*x^8 - 4*b*c^6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2
 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7), -1/84*(12*(b*
c^9*d^2*x^9 - b*c^7*d^2*x^7)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2
*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) - (18*b*c^5
*d^2*x^5 - (18*b*c^5 - 9*b*c^3 + 2*b*c)*d^2*x^7 - 9*b*c^3*d^2*x^3 + 2*b*c*d
^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 12*(a*c^8*d^2*x^8 - 4*a*c^6
*d^2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a*d^2 + (b*c^8*d^2*x^8 - 4*b
*c^6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^8, x)
```

3.91 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^{10}}\,dx$

Optimal. Leaf size=282

$$-\frac{2c^2(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{63dx^7}-\frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{9dx^9}-\frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}}+\frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}}-\frac{bc^3d^2\sqrt{}}{189x^6}$$

```
[Out] -(b*c^3*d^2*Sqrt[d - c^2*d*x^2])/(189*x^6*Sqrt[1 - c^2*x^2]) + (b*c^5*d^2*S
qrt[d - c^2*d*x^2])/(42*x^4*Sqrt[1 - c^2*x^2]) - (b*c^7*d^2*Sqrt[d - c^2*d*
x^2])/(21*x^2*Sqrt[1 - c^2*x^2]) - (b*c*d^2*(1 - c^2*x^2)^(7/2)*Sqrt[d - c^
2*d*x^2])/(72*x^8) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(9*d*x^9)
- (2*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (2*b*c^9*d
^2*Sqrt[d - c^2*d*x^2]*Log[x])/(63*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.178928, antiderivative size = 282, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {271, 264, 4691, 12, 446, 78, 43}

$$-\frac{2c^2(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{63dx^7}-\frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{9dx^9}-\frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}}+\frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}}-\frac{bc^3d^2\sqrt{}}{189x^6}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^10,x]
```


```
[Out] -(b*c^3*d^2*Sqrt[d - c^2*d*x^2])/(189*x^6*Sqrt[1 - c^2*x^2]) + (b*c^5*d^2*S
qrt[d - c^2*d*x^2])/(42*x^4*Sqrt[1 - c^2*x^2]) - (b*c^7*d^2*Sqrt[d - c^2*d*
x^2])/(21*x^2*Sqrt[1 - c^2*x^2]) - (b*c*d^2*(1 - c^2*x^2)^(7/2)*Sqrt[d - c^
2*d*x^2])/(72*x^8) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(9*d*x^9)
- (2*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (2*b*c^9*d
^2*Sqrt[d - c^2*d*x^2]*Log[x])/(63*Sqrt[1 - c^2*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^{10}}\,dx &= -\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(-7-2c^2x^2\right)\left(1-c^2x^2\right)^3}{63x^9}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int \frac{\left(d-c^2dx^2\right)^{5}}{x^{10}} \\
&= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(-7-2c^2x^2\right)\left(1-c^2x^2\right)^3}{x^9}\,dx}{63\sqrt{1-c^2x^2}} \\
&= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{2c^2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{63dx^7} - \frac{\left(bc\right.}{} \\
&= -\frac{bcd^2\left(1-c^2x^2\right)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} - \frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{2c^2\left(d-c\right.}{} \\
&= -\frac{bcd^2\left(1-c^2x^2\right)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} - \frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{2c^2\left(d-c\right.}{} \\
&= -\frac{bc^3d^2\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}} + \frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}} - \frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}} - \frac{bcd^2\left(1-c^2x^2\right)^{7}}{72x}
\end{aligned}
$$

Mathematica [A] time = 0.217809, size = 184, normalized size = 0.65

$$
\frac{d^2\sqrt{d-c^2dx^2}\left(840a\left(2c^2x^2+7\right)\left(c^2x^2-1\right)^4+bcx\sqrt{1-c^2x^2}\left(-4566c^8x^8-420c^6x^6+3150c^4x^4-2660c^2x^2+735\right)+8\right.}{52920x^9\left(c^2x^2-1\right)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(840*a*(-1 + c^2*x^2)^4*(7 + 2*c^2*x^2) + b*c*x*Sq
rt[1 - c^2*x^2]*(735 - 2660*c^2*x^2 + 3150*c^4*x^4 - 420*c^6*x^6 - 4566*c^8
*x^8) + 840*b*(-1 + c^2*x^2)^4*(7 + 2*c^2*x^2)*ArcSin[c*x]))/(52920*x^9*(-1
 + c^2*x^2)) - (2*b*c^9*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(63*Sqrt[1 - c^2*x^
2])
```

Maple [C] time = 0.477, size = 5323, normalized size = 18.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x)
```

```
[Out] result too large to display
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 3.12368, size = 1609, normalized size = 5.71

$$\left[\frac{24\left(bc^{11}d^2x^{11} - bc^9d^2x^9\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) - \left(12\,bc^7d^2x^7 - 90\,bc^5d^2x^5 - \left(12\,bc^7 - 90\,bc \right.\right.}{} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="fricas"
)
```

```
[Out] [1/1512*(24*(b*c^11*d^2*x^11 - b*c^9*d^2*x^9)*sqrt(d)*log((c^2*d*x^6 + c^2*
d*x^2 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) -
 d)/(c^2*x^4 - x^2)) - (12*b*c^7*d^2*x^7 - 90*b*c^5*d^2*x^5 - (12*b*c^7 - 9
0*b*c^5 + 76*b*c^3 - 21*b*c)*d^2*x^9 + 76*b*c^3*d^2*x^3 - 21*b*c*d^2*x)*sqr
t(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 24*(2*a*c^10*d^2*x^10 - a*c^8*d^2*x^
8 - 16*a*c^6*d^2*x^6 + 34*a*c^4*d^2*x^4 - 26*a*c^2*d^2*x^2 + 7*a*d^2 + (2*b
*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 16*b*c^6*d^2*x^6 + 34*b*c^4*d^2*x^4 - 26*b
*c^2*d^2*x^2 + 7*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)
, -1/1512*(48*(b*c^11*d^2*x^11 - b*c^9*d^2*x^9)*sqrt(-d)*arctan(sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^
```

```
2 + d)) + (12*b*c^7*d^2*x^7 - 90*b*c^5*d^2*x^5 - (12*b*c^7 - 90*b*c^5 + 76*
b*c^3 - 21*b*c)*d^2*x^9 + 76*b*c^3*d^2*x^3 - 21*b*c*d^2*x)*sqrt(-c^2*d*x^2
+ d)*sqrt(-c^2*x^2 + 1) - 24*(2*a*c^10*d^2*x^10 - a*c^8*d^2*x^8 - 16*a*c^6*
d^2*x^6 + 34*a*c^4*d^2*x^4 - 26*a*c^2*d^2*x^2 + 7*a*d^2 + (2*b*c^10*d^2*x^1
0 - b*c^8*d^2*x^8 - 16*b*c^6*d^2*x^6 + 34*b*c^4*d^2*x^4 - 26*b*c^2*d^2*x^2
+ 7*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**10,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^10, x)
```

3.92 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^{12}}\,dx$

Optimal. Leaf size=361

$$-\frac{8c^4\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{693dx^7}-\frac{4c^2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{99dx^9}-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}}+\frac{2bc^9d^2\sqrt{\cdots}}{693x^2\sqrt{\cdots}}$$

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(110*x^10*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d^2
*Sqrt[d - c^2*d*x^2])/(792*x^8*Sqrt[1 - c^2*x^2]) - (113*b*c^5*d^2*Sqrt[d -
 c^2*d*x^2])/(4158*x^6*Sqrt[1 - c^2*x^2]) + (b*c^7*d^2*Sqrt[d - c^2*d*x^2])
/(924*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^9*d^2*Sqrt[d - c^2*d*x^2])/(693*x^2*S
qrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(11*d*x^11)
 - (4*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(99*d*x^9) - (8*c^4*(d
 - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(693*d*x^7) - (8*b*c^11*d^2*Sqrt[d
 - c^2*d*x^2]*Log[x])/(693*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.222861, antiderivative size = 361, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {271, 264, 4691, 12, 1251, 893}

$$-\frac{8c^4\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{693dx^7}-\frac{4c^2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{99dx^9}-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}}+\frac{2bc^9d^2\sqrt{\cdots}}{693x^2\sqrt{\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^12,x]
```



```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(110*x^10*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d^2
*Sqrt[d - c^2*d*x^2])/(792*x^8*Sqrt[1 - c^2*x^2]) - (113*b*c^5*d^2*Sqrt[d -
 c^2*d*x^2])/(4158*x^6*Sqrt[1 - c^2*x^2]) + (b*c^7*d^2*Sqrt[d - c^2*d*x^2])
/(924*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^9*d^2*Sqrt[d - c^2*d*x^2])/(693*x^2*S
qrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(11*d*x^11)
 - (4*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(99*d*x^9) - (8*c^4*(d
 - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(693*d*x^7) - (8*b*c^11*d^2*Sqrt[d
 - c^2*d*x^2]*Log[x])/(693*Sqrt[1 - c^2*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
```

```
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^{12}}\,dx = -\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^3\left(-63-28c^2x^2-8c^4x^4\right)}{693x^{11}}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int \frac{\left(d-\right.}{}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^3\left(-63-28c^2x^2-8c^4\right.}{x^{11}}}{693\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{4c^2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{99dx^9} - \frac{\left(bc\right.}{}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{4c^2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{99dx^9} - \frac{8c^4}{}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} + \frac{23bc^3d^2\sqrt{d-c^2dx^2}}{792x^8\sqrt{1-c^2x^2}} - \frac{113bc^5d^2\sqrt{d-c^2dx^2}}{4158x^6\sqrt{1-c^2x^2}} + \frac{bc^7d^2\sqrt{d-}}{924x^4\sqrt{1}}$$

Mathematica [A] time = 0.237405, size = 209, normalized size = 0.58

$$\frac{d^2\sqrt{d-c^2dx^2}\left(2520a\left(8c^4x^4+28c^2x^2+63\right)\left(c^2x^2-1\right)^4 - bcx\sqrt{1-c^2x^2}\left(59048c^{10}x^{10}+5040c^8x^8+1890c^6x^6-47460\right.\right.}{1746360x^{11}\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(2520*a*(-1 + c^2*x^2)^4*(63 + 28*c^2*x^2 + 8*c^4*
x^4) - b*c*x*Sqrt[1 - c^2*x^2]*(-15876 + 50715*c^2*x^2 - 47460*c^4*x^4 + 18
90*c^6*x^6 + 5040*c^8*x^8 + 59048*c^10*x^10) + 2520*b*(-1 + c^2*x^2)^4*(63
```

```
+ 28*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]))/(1746360*x^11*(-1 + c^2*x^2)) - (8*
b*c^11*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(693*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.648, size = 6758, normalized size = 18.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x)
```

```
[Out] result too large to display
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 3.6102, size = 1871, normalized size = 5.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="fricas"
)
```

```
[Out] [1/83160*(480*(b*c^13*d^2*x^13 - b*c^11*d^2*x^11)*sqrt(d)*log((c^2*d*x^6 +
c^2*d*x^2 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(
d) - d)/(c^2*x^4 - x^2)) - (240*b*c^9*d^2*x^9 + 90*b*c^7*d^2*x^7 - (240*b*c
^9 + 90*b*c^7 - 2260*b*c^5 + 2415*b*c^3 - 756*b*c)*d^2*x^11 - 2260*b*c^5*d^
2*x^5 + 2415*b*c^3*d^2*x^3 - 756*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*
x^2 + 1) + 120*(8*a*c^12*d^2*x^12 - 4*a*c^10*d^2*x^10 - a*c^8*d^2*x^8 - 116
*a*c^6*d^2*x^6 + 274*a*c^4*d^2*x^4 - 224*a*c^2*d^2*x^2 + 63*a*d^2 + (8*b*c^
12*d^2*x^12 - 4*b*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 116*b*c^6*d^2*x^6 + 274*b
*c^4*d^2*x^4 - 224*b*c^2*d^2*x^2 + 63*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 +
 d))/(c^2*x^13 - x^11), -1/83160*(960*(b*c^13*d^2*x^13 - b*c^11*d^2*x^11)*s
qrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(
c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (240*b*c^9*d^2*x^9 + 90*b*c^7*d^2*x^7 -
 (240*b*c^9 + 90*b*c^7 - 2260*b*c^5 + 2415*b*c^3 - 756*b*c)*d^2*x^11 - 2260
*b*c^5*d^2*x^5 + 2415*b*c^3*d^2*x^3 - 756*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*s
qrt(-c^2*x^2 + 1) - 120*(8*a*c^12*d^2*x^12 - 4*a*c^10*d^2*x^10 - a*c^8*d^2*
x^8 - 116*a*c^6*d^2*x^6 + 274*a*c^4*d^2*x^4 - 224*a*c^2*d^2*x^2 + 63*a*d^2
+ (8*b*c^12*d^2*x^12 - 4*b*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 116*b*c^6*d^2*x^
6 + 274*b*c^4*d^2*x^4 - 224*b*c^2*d^2*x^2 + 63*b*d^2)*arcsin(c*x))*sqrt(-c^
```

```
2*d*x^2 + d))/(c^2*x^13 - x^11)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**12,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^12, x)
```

3.93 $\int x^5 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=354

$$-\frac{\left(d-c^2dx^2\right)^{11/2}\left(a+b\sin^{-1}(cx)\right)}{11c^6d^3}+\frac{2\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{9c^6d^2}-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^6d}-\frac{bc^5d^2x^{11}\sqrt{d-}}{121\sqrt{1-c^2}}$$

```
[Out] (8*b*d^2*x*Sqrt[d - c^2*d*x^2])/(693*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d^2*x^3*
Sqrt[d - c^2*d*x^2])/(2079*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^5*Sqrt[d - c^2
*d*x^2])/(1155*c*Sqrt[1 - c^2*x^2]) - (113*b*c*d^2*x^7*Sqrt[d - c^2*d*x^2])
/(4851*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d^2*x^9*Sqrt[d - c^2*d*x^2])/(891*Sqr
t[1 - c^2*x^2]) - (b*c^5*d^2*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d) + (2*(d - c^2*d
*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^6*d^2) - ((d - c^2*d*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(11*c^6*d^3)
```

Rubi [A] time = 0.246211, antiderivative size = 354, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {266, 43, 4691, 12, 1153}

$$-\frac{\left(d-c^2dx^2\right)^{11/2}\left(a+b\sin^{-1}(cx)\right)}{11c^6d^3}+\frac{2\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{9c^6d^2}-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^6d}-\frac{bc^5d^2x^{11}\sqrt{d-}}{121\sqrt{1-c^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (8*b*d^2*x*Sqrt[d - c^2*d*x^2])/(693*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d^2*x^3*
Sqrt[d - c^2*d*x^2])/(2079*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^5*Sqrt[d - c^2
*d*x^2])/(1155*c*Sqrt[1 - c^2*x^2]) - (113*b*c*d^2*x^7*Sqrt[d - c^2*d*x^2])
/(4851*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d^2*x^9*Sqrt[d - c^2*d*x^2])/(891*Sqr
t[1 - c^2*x^2]) - (b*c^5*d^2*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d) + (2*(d - c^2*d
*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^6*d^2) - ((d - c^2*d*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(11*c^6*d^3)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
```

```
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rubi steps

$$\int x^5 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) dx = -\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^3\left(-8-28c^2x^2-63c^4x^4\right)}{693c^6}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int x^5$$

$$= -\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^3\left(-8-28c^2x^2-63c^4x^4\right)dx}{693c^5\sqrt{1-c^2x^2}} + \frac{1}{2}\left(a+b\sin\right.$$

$$= -\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int \left(-8-4c^2x^2-3c^4x^4+113c^6x^6-161c^8x^8+63c^{10}x^{10}\right)}{693c^5\sqrt{1-c^2x^2}}$$

$$= \frac{8bd^2x\sqrt{d-c^2dx^2}}{693c^5\sqrt{1-c^2x^2}} + \frac{4bd^2x^3\sqrt{d-c^2dx^2}}{2079c^3\sqrt{1-c^2x^2}} + \frac{bd^2x^5\sqrt{d-c^2dx^2}}{1155c\sqrt{1-c^2x^2}} - \frac{113bcd^2x^7\sqrt{}}{4851\sqrt{1-}}$$

Mathematica [A] time = 0.200128, size = 160, normalized size = 0.45

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(3465a\left(63c^4x^4+28c^2x^2+8\right)\left(1-c^2x^2\right)^{7/2}+bcx\left(19845c^{10}x^{10}-61985c^8x^8+55935c^6x^6-2079c^4x^4\right.\right.}{2401245c^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(d^2*Sqrt[d - c^2*d*x^2]*(3465*a*(1 - c^2*x^2)^(7/2)*(8 + 28*c^2*x^2 + 63*
c^4*x^4) + b*c*x*(-27720 - 4620*c^2*x^2 - 2079*c^4*x^4 + 55935*c^6*x^6 - 61
985*c^8*x^8 + 19845*c^10*x^10) + 3465*b*(1 - c^2*x^2)^(7/2)*(8 + 28*c^2*x^2
 + 63*c^4*x^4)*ArcSin[c*x]))/(2401245*c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.47, size = 1775, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] a*(-1/11*x^4*(-c^2*d*x^2+d)^(7/2)/c^2/d+4/11/c^2*(-1/9*x^2*(-c^2*d*x^2+d)^(
7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2)))+b*(1/247808*(-d*(c^2*x^2-1))^(
1/2)*(1+11*I*(-c^2*x^2+1)^(1/2)*x*c+4096*c^8*x^8-2352*c^6*x^6+620*c^4*x^4-6
1*c^2*x^2-220*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+2816*I*(-c^2*x^2+1)^(1/2)*x^9*c^
9+1024*x^12*c^12-3328*c^10*x^10-1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+1232*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5-2816*I*(-c^2*x^2+1)^(1/2)*x^7*c^7)*(I+11*arcsin(
c*x))*d^2/c^6/(c^2*x^2-1)-1/165888*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-70
4*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(
1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*
d^2/c^6/(c^2*x^2-1)-5/100352*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6
-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c
^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)
*(I+7*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+1/10240*(-d*(c^2*x^2-1))^(1/2)*(16*c
^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2
+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d^2/c^6/(
c^2*x^2-1)+5/9216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2
+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d^2/c^6/(
c^2*x^2-1)-5/1024*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-
1)*(arcsin(c*x)+I)*d^2/c^6/(c^2*x^2-1)-5/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c
^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^6/(c^2*x^2-1)+5/9216*(
-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x
^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+1/10240
*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1
)*(-I+5*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)-5/100352*(-d*(c^2*x^2-1))^(1/2)*(6
4*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-
144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1
/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)-1/165888*(-d*(
c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-576*I*(-c
^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+688*c^
6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)^(1/2)*x
*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+1/247808*(-d*(c^2*x
^2-1))^(1/2)*(1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+1024*x^12*c^12-2816*I*(-c
^2*x^2+1)^(1/2)*x^9*c^9-3328*c^10*x^10+2816*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+40
96*c^8*x^8-1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2352*c^6*x^6+220*I*(-c^2*x^2+1
)^(1/2)*x^3*c^3+620*c^4*x^4-11*I*(-c^2*x^2+1)^(1/2)*x*c-61*c^2*x^2+1)*(-I+1
1*arcsin(c*x))*d^2/c^6/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.31399, size = 666, normalized size = 1.88

$$\frac{\left(19845\,bc^{11}d^{2}x^{11}-61985\,bc^{9}d^{2}x^{9}+55935\,bc^{7}d^{2}x^{7}-2079\,bc^{5}d^{2}x^{5}-4620\,bc^{3}d^{2}x^{3}-27720\,bcd^{2}x\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+\cdots}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/2401245*((19845*b*c^11*d^2*x^11 - 61985*b*c^9*d^2*x^9 + 55935*b*c^7*d^2*x
^7 - 2079*b*c^5*d^2*x^5 - 4620*b*c^3*d^2*x^3 - 27720*b*c*d^2*x)*sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3465*(63*a*c^12*d^2*x^12 - 224*a*c^10*d^2*x^
10 + 274*a*c^8*d^2*x^8 - 116*a*c^6*d^2*x^6 - a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^
2 + 8*a*d^2 + (63*b*c^12*d^2*x^12 - 224*b*c^10*d^2*x^10 + 274*b*c^8*d^2*x^8
 - 116*b*c^6*d^2*x^6 - b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + 8*b*d^2)*arcsin(c*
x))*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^5, x)
```

3.94 $\int x^3 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=278

$$\frac{\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{9c^4d^2}-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^4d}-\frac{bc^5d^2x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}+\frac{19bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}-\frac{bcd^2x}{21}$$

```
[Out] (2*b*d^2*x*Sqrt[d - c^2*d*x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^3*Sqr
t[d - c^2*d*x^2])/(189*c*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^5*Sqrt[d - c^2*d*x
^2])/(21*Sqrt[1 - c^2*x^2]) + (19*b*c^3*d^2*x^7*Sqrt[d - c^2*d*x^2])/(441*S
qrt[1 - c^2*x^2]) - (b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d) + ((d - c^2*d*x
^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^4*d^2)
```

Rubi [A] time = 0.20343, antiderivative size = 278, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {266, 43, 4691, 12, 373}

$$\frac{\left(d-c^2dx^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{9c^4d^2}-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^4d}-\frac{bc^5d^2x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}+\frac{19bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}-\frac{bcd^2x}{21}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (2*b*d^2*x*Sqrt[d - c^2*d*x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^3*Sqr
t[d - c^2*d*x^2])/(189*c*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^5*Sqrt[d - c^2*d*x
^2])/(21*Sqrt[1 - c^2*x^2]) + (19*b*c^3*d^2*x^7*Sqrt[d - c^2*d*x^2])/(441*S
qrt[1 - c^2*x^2]) - (b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d) + ((d - c^2*d*x
^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^4*d^2)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4691

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[a + b*ArcSi
n[c*x], Int[x^m*(d + e*x^2)^p, x], x] - Dist[(b*c*d^(p - 1/2)*Sqrt[d + e*x^
2])/Sqrt[1 - c^2*x^2], Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x
]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p + 1/2, 0] &&
 (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 373

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)dx=-\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(-2-7c^2x^2\right)\left(1-c^2x^2\right)^3}{63c^4}dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx)\right)\int x^3\left(d-c^2\right.$$

$$=-\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(-2-7c^2x^2\right)\left(1-c^2x^2\right)^3dx}{63c^3\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+b\sin^{-1}(cx)\right)\text{Sul}$$

$$=-\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+15c^4x^4-19c^6x^6+7c^8x^8\right)dx}{63c^3\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+b\right.$$

$$=\frac{2bd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}-\frac{bcd^2x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}+\frac{19bc^3d^2x^7\sqrt{d}}{441\sqrt{1-}}$$

Mathematica [A] time = 0.166613, size = 137, normalized size = 0.49

$$\frac{d^2\sqrt{d-c^2dx^2}\left(-63a\left(7c^2x^2+2\right)\left(1-c^2x^2\right)^{7/2}+b\left(-49c^9x^9+171c^7x^7-189c^5x^5+21c^3x^3+126cx\right)-63b\left(7c^2x^2+2\right)\right.}{3969c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(-63*a*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2) + b*(12
6*c*x + 21*c^3*x^3 - 189*c^5*x^5 + 171*c^7*x^7 - 49*c^9*x^9) - 63*b*(1 - c^
2*x^2)^(7/2)*(2 + 7*c^2*x^2)*ArcSin[c*x]))/(3969*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.311, size = 1063, normalized size = 3.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] a*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2))+b*(
1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1
)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-43
2*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-
9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/25088
*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7
*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2
```

```
+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^4/(
c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+
1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d^2/c^4/(c
^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)
*(arcsin(c*x)+I)*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^4/(c^2*x^2-1)+1/576*(-d*(
c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1
)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/25088*(-d
*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2
*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x
^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d^2/c^4/(c^2
*x^2-1)+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+25
6*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)
^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I
*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1
))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.25271, size = 548, normalized size = 1.97

$$\frac{\left(49\,bc^9d^2x^9 - 171\,bc^7d^2x^7 + 189\,bc^5d^2x^5 - 21\,bc^3d^2x^3 - 126\,bcd^2x\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1} + 63\left(7\,ac^{10}d^2x^{10} - 26\,ac^8d^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3969*((49*b*c^9*d^2*x^9 - 171*b*c^7*d^2*x^7 + 189*b*c^5*d^2*x^5 - 21*b*c^
3*d^2*x^3 - 126*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 63*(7*
a*c^10*d^2*x^10 - 26*a*c^8*d^2*x^8 + 34*a*c^6*d^2*x^6 - 16*a*c^4*d^2*x^4 -
a*c^2*d^2*x^2 + 2*a*d^2 + (7*b*c^10*d^2*x^10 - 26*b*c^8*d^2*x^8 + 34*b*c^6*
d^2*x^6 - 16*b*c^4*d^2*x^4 - b*c^2*d^2*x^2 + 2*b*d^2)*arcsin(c*x))*sqrt(-c^
2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^3, x)
```

3.95 $\int x \left(d-c^2 d x^2\right)^{5/2} \left(a+b \sin^{-1}(cx)\right) \, dx$

Optimal. Leaf size=202

$$-\frac{\left(d-c^2 d x^2\right)^{7/2} \left(a+b \sin^{-1}(cx)\right)}{7 c^2 d}-\frac{b c^5 d^2 x^7 \sqrt{d-c^2 d x^2}}{49 \sqrt{1-c^2 x^2}}+\frac{3 b c^3 d^2 x^5 \sqrt{d-c^2 d x^2}}{35 \sqrt{1-c^2 x^2}}-\frac{b c d^2 x^3 \sqrt{d-c^2 d x^2}}{7 \sqrt{1-c^2 x^2}}+\frac{b d^2 x \sqrt{d-c^2 d x^2}}{7 c \sqrt{1-c^2 x^2}}$$

```
[Out] (b*d^2*x*Sqrt[d - c^2*d*x^2])/(7*c*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^3*Sqrt[d
 - c^2*d*x^2])/(7*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*x^5*Sqrt[d - c^2*d*x^2]
)/(35*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 -
 c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^2*d)
```

Rubi [A] time = 0.0907841, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.08, Rules used = {4677, 194}

$$-\frac{\left(d-c^2 d x^2\right)^{7/2} \left(a+b \sin^{-1}(cx)\right)}{7 c^2 d}-\frac{b c^5 d^2 x^7 \sqrt{d-c^2 d x^2}}{49 \sqrt{1-c^2 x^2}}+\frac{3 b c^3 d^2 x^5 \sqrt{d-c^2 d x^2}}{35 \sqrt{1-c^2 x^2}}-\frac{b c d^2 x^3 \sqrt{d-c^2 d x^2}}{7 \sqrt{1-c^2 x^2}}+\frac{b d^2 x \sqrt{d-c^2 d x^2}}{7 c \sqrt{1-c^2 x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*d^2*x*Sqrt[d - c^2*d*x^2])/(7*c*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^3*Sqrt[d
 - c^2*d*x^2])/(7*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*x^5*Sqrt[d - c^2*d*x^2]
)/(35*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 -
 c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^2*d)
```


Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int x \left(d-c^2 d x^2\right)^{5/2} \left(a+b \sin^{-1}(cx)\right) \, dx &= -\frac{\left(d-c^2 d x^2\right)^{7/2} \left(a+b \sin^{-1}(cx)\right)}{7 c^2 d}+\frac{\left(b d^2 \sqrt{d-c^2 d x^2}\right) \int \left(1-c^2 x^2\right)^3 \, dx}{7 c \sqrt{1-c^2 x^2}}\\ &= -\frac{\left(d-c^2 d x^2\right)^{7/2} \left(a+b \sin^{-1}(cx)\right)}{7 c^2 d}+\frac{\left(b d^2 \sqrt{d-c^2 d x^2}\right) \int \left(1-3 c^2 x^2+3 c^4 x^4-c^6\right.}{7 c \sqrt{1-c^2 x^2}}\\ &= \frac{b d^2 x \sqrt{d-c^2 d x^2}}{7 c \sqrt{1-c^2 x^2}}-\frac{b c d^2 x^3 \sqrt{d-c^2 d x^2}}{7 \sqrt{1-c^2 x^2}}+\frac{3 b c^3 d^2 x^5 \sqrt{d-c^2 d x^2}}{35 \sqrt{1-c^2 x^2}}-\frac{b c^5 d^2 x^7 \sqrt{d-c^2}}{49 \sqrt{1-c^2 x^2}}\end{aligned}$$

Mathematica [A] time = 0.0694342, size = 93, normalized size = 0.46

$$\frac{d^2\sqrt{d-c^2dx^2}\left(\left(c^2x^2-1\right)^3\left(a+b\sin^{-1}(cx)\right)+\frac{bc\left(-\frac{1}{7}c^6x^7+\frac{3c^4x^5}{5}-c^2x^3+x\right)}{\sqrt{1-c^2x^2}}\right)}{7c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*((b*c*(x - c^2*x^3 + (3*c^4*x^5)/5 - (c^6*x^7)/7))
/Sqrt[1 - c^2*x^2] + (-1 + c^2*x^2)^3*(a + b*ArcSin[c*x])))/(7*c^2)
```

Maple [C] time = 0.223, size = 921, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] -1/7*a/c^2/d*(-c^2*d*x^2+d)^(7/2)+b*(1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*
x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2
+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+
1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/640*(-d*(c^2*x^2-1)
)^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+2
0*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*
x))*d^2/c^2/(c^2*x^2-1)+1/128*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x
))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)
^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^2/(c^2*x^2-1
)+1/128*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*
I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^2-1
)-1/640*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-
20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^
2*x^2-1)*(-I+5*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/6272*(-d*(c^2*x^2-1))^(1/
2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5
*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+
1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1))
```

Maxima [A] time = 1.6537, size = 132, normalized size = 0.65

$$-\frac{\left(-c^2dx^2+d\right)^{\frac{7}{2}}b\arcsin\left(cx\right)}{7\,c^2d}-\frac{\left(-c^2dx^2+d\right)^{\frac{7}{2}}a}{7\,c^2d}-\frac{\left(5\,c^6d^{\frac{7}{2}}x^7-21\,c^4d^{\frac{7}{2}}x^5+35\,c^2d^{\frac{7}{2}}x^3-35\,d^{\frac{7}{2}}x\right)b}{245\,cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*(-c^2*d*x^2 + d)^(7/2)*b*arcsin(c*x)/(c^2*d) - 1/7*(-c^2*d*x^2 + d)^(7
/2)*a/(c^2*d) - 1/245*(5*c^6*d^(7/2)*x^7 - 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7
```

```
/2)*x^3 - 35*d^(7/2)*x)*b/(c*d)
```

Fricas [A] time = 2.25337, size = 448, normalized size = 2.22

$$\frac{\left(5\,bc^{7}d^{2}x^{7}-21\,bc^{5}d^{2}x^{5}+35\,bc^{3}d^{2}x^{3}-35\,bcd^{2}x\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}+35\left(ac^{8}d^{2}x^{8}-4\,ac^{6}d^{2}x^{6}+6\,ac^{4}d^{2}x^{4}-4\,ac^{2}d\right.}{245\left(c^{4}x^{2}-c^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/245*((5*b*c^7*d^2*x^7 - 21*b*c^5*d^2*x^5 + 35*b*c^3*d^2*x^3 - 35*b*c*d^2*
x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 35*(a*c^8*d^2*x^8 - 4*a*c^6*d^
2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a*d^2 + (b*c^8*d^2*x^8 - 4*b*c^
6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x, x)
```

3.96 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=361

$$\frac{ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-$$

```
[Out] (-23*b*c*d^2*x*Sqrt[d - c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2*
x^3*Sqrt[d - c^2*d*x^2])/(45*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^5*Sqrt[d - c
^2*d*x^2])/(25*Sqrt[1 - c^2*x^2]) + d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x]) + (d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 + ((d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x]))/5 - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*d^2*Sqrt[d - c^2*d*x
^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*d^2*Sqrt[d - c
^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.462722, antiderivative size = 361, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4699, 4697, 4709, 4183, 2279, 2391, 8, 194}

$$\frac{ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x,x]
```


```
[Out] (-23*b*c*d^2*x*Sqrt[d - c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2*
x^3*Sqrt[d - c^2*d*x^2])/(45*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^5*Sqrt[d - c
^2*d*x^2])/(25*Sqrt[1 - c^2*x^2]) + d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x]) + (d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 + ((d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x]))/5 - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*d^2*Sqrt[d - c^2*d*x
^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*d^2*Sqrt[d - c
^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
```

```
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+d\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x}\,dx -$$

$$= \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+d^2\int$$

$$= -\frac{8bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+d^2\sqrt{d-}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+d^2\sqrt{d}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+d^2\sqrt{d}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+d^2\sqrt{d}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+d^2\sqrt{d}$$

Mathematica [A] time = 1.7149, size = 394, normalized size = 1.09

$$\frac{bd^2\sqrt{d-c^2dx^2}\left(i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\sin^{-1}(cx)-cx+\sin^{-1}(cx)\log\left(1-e^{i}\right.\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (a*d^2*Sqrt[d - c^2*d*x^2]*(23 - 11*c^2*x^2 + 3*c^4*x^4))/15 + a*d^(5/2)*Lo
g[x] - a*d^(5/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d^2*Sqrt[d - c^2
*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*
ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I
*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b*d
^2*Sqrt[d - c^2*d*x^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*
ArcSin[c*x]]) + Sin[3*ArcSin[c*x]]))/(18*Sqrt[1 - c^2*x^2]) + (b*d^2*Sqrt[d
 - c^2*d*x^2]*(450*c*x - 15*ArcSin[c*x]*(30*Sqrt[1 - c^2*x^2] + 5*Cos[3*Arc
Sin[c*x]] - 3*Cos[5*ArcSin[c*x]]) + 25*Sin[3*ArcSin[c*x]] - 9*Sin[5*ArcSin[
c*x]]))/(3600*Sqrt[1 - c^2*x^2])
```

Maple [A] time = 0.237, size = 652, normalized size = 1.8

$$\frac{a}{5}\left(-c^2dx^2+d\right)^{\frac{5}{2}}+\frac{ad}{3}\left(-c^2dx^2+d\right)^{\frac{3}{2}}-ad^{\frac{5}{2}}\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)+a\sqrt{-c^2dx^2+d}\,d^2-\frac{ibd^2}{c^2x^2-1}\sqrt{-d\left(c^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x)
```

```
[Out] 1/5*(-c^2*d*x^2+d)^(5/2)*a+1/3*a*d*(-c^2*d*x^2+d)^(3/2)-a*d^(5/2)*ln((2*d+2
*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a*(-c^2*d*x^2+d)^(1/2)*d^2-I*b*(-d*(c^2*x
```

```
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*polylog(2,-I*c*x-(-c^2*x^2+
1)^(1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-
1)*arcsin(c*x)*x^6*c^6-14/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsi
n(c*x)*x^4*c^4+34/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x
^2*c^2+1/25*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^5
*c^5-11/45*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3*
c^3+23/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c+b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2
*x^2-1)*d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-23/15*b*(-d*(c^2*x^2
-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right) + a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x, x)
```

3.97 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=386

$$-\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}\left(a+b\sin\right.$$

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(2*x*Sqrt[1 - c^2*x^2]) + (7*b*c^3*d^2*x*Sqr
t[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^3*Sqrt[d - c^2*d*x^2
])/(9*Sqrt[1 - c^2*x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/2 - (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 - ((d - c^2*d
*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((5*I)/
2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c
^2*x^2] + (((5*I)/2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.458406, antiderivative size = 386, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4695, 4699, 4697, 4709, 4183, 2279, 2391, 8, 270}

$$-\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}\left(a+b\sin\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(2*x*Sqrt[1 - c^2*x^2]) + (7*b*c^3*d^2*x*Sqr
t[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^3*Sqrt[d - c^2*d*x^2
])/(9*Sqrt[1 - c^2*x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/2 - (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 - ((d - c^2*d
*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((5*I)/
2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c
^2*x^2] + (((5*I)/2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
```

```
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^3}dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{2x^2} - \frac{1}{2}\left(5c^2d\right)\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x}$$

$$= -\frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{2x^2} - \frac{1}{2}\left(5c\right.$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}}{6\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2d}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2d}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2d}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2d}$$

Mathematica [A] time = 5.29996, size = 484, normalized size = 1.25

$$144bc^2d^3x^2\sqrt{1-c^2x^2}\left(-i\left(\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\right)-\sqrt{1-c^2x^2}\sin^{-1}(cx)+cx-\sin^{-1}(cx)\left(\text{lo}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (-12*a*d^3*(-1 + c^2*x^2)*(-3 - 14*c^2*x^2 + 2*c^4*x^4) - 180*a*c^2*d^(5/2)
*x^2*Sqrt[d - c^2*d*x^2]*Log[x] + 180*a*c^2*d^(5/2)*x^2*Sqrt[d - c^2*d*x^2]
*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + 144*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]
*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*
x])] - Log[1 + E^(I*ArcSin[c*x])]) - I*(PolyLog[2, -E^(I*ArcSin[c*x])] - Po
lyLog[2, E^(I*ArcSin[c*x])])) + 2*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]*(9*c*x -
3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin[c*x
]]) - 9*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]*(2*Cot[ArcSin[c*x]/2] + ArcSin[c*x]
*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 4*ArcSin
[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (
4*I)*PolyLog[2, E^(I*ArcSin[c*x])] - ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 2*T
an[ArcSin[c*x]/2]))/(72*x^2*Sqrt[d - c^2*d*x^2])
```

Maple [A] time = 0.273, size = 704, normalized size = 1.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(7/2)-1/2*a*c^2*(-c^2*d*x^2+d)^(5/2)-5/6*a*c^2*
d*(-c^2*d*x^2+d)^(3/2)+5/2*a*c^2*d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(
1/2))/x)-5/2*a*c^2*(-c^2*d*x^2+d)^(1/2)*d^2-5*b*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))+5*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/9*b*(-d*(c^2*x^2-1))^(1/2)*c^5*d
^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3-7/3*b*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/
(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+11/6*b*(-d*(c^2*x^2-1))^(1/2)*c^2*d^2/(c^2
*x^2-1)*arcsin(c*x)+1/2*b*d^2*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)*arcsin
(c*x)+1/3*b*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)*x^4-8/3*
b*(-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)*x^2+1/2*b*d^2*(-d*
(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+5*I*b*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))-5*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x
^2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{5}{2}} (b \arcsin{(cx)} + a)}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^3, x)
```

3.98 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=389

$$\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}\left(a+\right.$$

```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(12*x^3*Sqrt[1 - c^2*x^2]) + (9*b*c^3*d^2*Sq
rt[d - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x*Sqrt[d - c^2*d*x^
2])/Sqrt[1 - c^2*x^2] + (15*c^4*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
)/8 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*x^2) - ((d - c
^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(4*x^4) - (15*c^4*d^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt[1 - c^2*x^2]) +
 (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/
Sqrt[1 - c^2*x^2] - (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^
(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.4552, antiderivative size = 389, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4695, 4697, 4709, 4183, 2279, 2391, 8, 14, 270}

$$\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}\left(a+\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^5,x]
```


```
[Out] -(b*c*d^2*Sqrt[d - c^2*d*x^2])/(12*x^3*Sqrt[1 - c^2*x^2]) + (9*b*c^3*d^2*Sq
rt[d - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x*Sqrt[d - c^2*d*x^
2])/Sqrt[1 - c^2*x^2] + (15*c^4*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
)/8 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*x^2) - ((d - c
^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(4*x^4) - (15*c^4*d^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt[1 - c^2*x^2]) +
 (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/
Sqrt[1 - c^2*x^2] - (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^
(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
```

```
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^5}dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} - \frac{1}{4}\left(5c^2d\right)\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{x^3}$$

$$= \frac{5c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8x^2} - \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{4x^4} + \frac{1}{8}(1$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3d^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2d}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2}$$

Mathematica [A] time = 6.13157, size = 640, normalized size = 1.65

$$\frac{bc^4d^2\sqrt{d-c^2dx^2}\left(i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right) - i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right) + \sqrt{1-c^2x^2}\sin^{-1}(cx) - cx + \sin^{-1}(cx)\log\left(1-\right.\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*d^2*Sqrt[d - c^2*d*x^2]*(-2 + 9*c^2*x^2 + 8*c^4*x^4))/(8*x^4) + (15*a*c^
4*d^(5/2)*Log[x])/8 - (15*a*c^4*d^(5/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]
])/8 + (b*c^4*d^2*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcS
in[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x
])]))/Sqrt[1 - c^2*x^2] - (b*c^4*d^3*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/
2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c
*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*A
rcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin
[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(4*Sqrt[d - c^2*d*x^2]) + (b*c^4*d^2*Sq
rt[d - c^2*d*x^2]*(8*Cot[ArcSin[c*x]/2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^
2 - c*x*Csc[ArcSin[c*x]/2]^4 - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcS
in[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x
])] - (24*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin
[c*x])] - 6*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x
]/2]^4 - (16*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*
Sqrt[1 - c^2*x^2])
```

Maple [A] time = 0.312, size = 727, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(7/2)+3/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(7/2)+3/8*
a*c^4*(-c^2*d*x^2+d)^(5/2)+5/8*a*c^4*d*(-c^2*d*x^2+d)^(3/2)-15/8*a*c^4*d^(5
/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+15/8*a*c^4*(-c^2*d*x^2+d)^(1
/2)*d^2+b*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)*x^2+b*(-d*
(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+1/8*b*(-d*(c^2*
x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)-9/8*b*d^2*(-d*(c^2*x^2-1))^(1
/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-11/8*b*d^2*(-d*(c^2*x^2-1))^(1/2)/
x^2/(c^2*x^2-1)*arcsin(c*x)*c^2+1/12*b*d^2*(-d*(c^2*x^2-1))^(1/2)/x^3/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/4*b*d^2*(-d*(c^2*x^2-1))^(1/2)/x^4/(c^2*x^2-1
)*arcsin(c*x)+15*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4*d^2/(8*c^2
*x^2-8)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-15*b*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)*c^4*d^2/(8*c^2*x^2-8)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x
^2+1)^(1/2))+15*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4*d^2/(8*c^
2*x^2-8)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-15*I*b*(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)*c^4*d^2/(8*c^2*x^2-8)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2
))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^5, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)/x^5, x)
```

3.99 $\int \sqrt{1-x^2} \sin^{-1}(x) \, dx$

Optimal. Leaf size=34

$$-\frac{x^2}{4}+\frac{1}{2}\sqrt{1-x^2}x\sin^{-1}(x)+\frac{1}{4}\sin^{-1}(x)^2$$

```
[Out] -x^2/4 + (x*Sqrt[1 - x^2]*ArcSin[x])/2 + ArcSin[x]^2/4
```

Rubi [A] time = 0.0305888, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4647, 4641, 30}

$$-\frac{x^2}{4}+\frac{1}{2}\sqrt{1-x^2}x\sin^{-1}(x)+\frac{1}{4}\sin^{-1}(x)^2$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[1 - x^2]*ArcSin[x],x]
```

```
[Out] -x^2/4 + (x*Sqrt[1 - x^2]*ArcSin[x])/2 + ArcSin[x]^2/4
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \sqrt{1-x^2}\sin^{-1}(x)\,dx &= \frac{1}{2}x\sqrt{1-x^2}\sin^{-1}(x)-\frac{\int x\,dx}{2}+\frac{1}{2}\int \frac{\sin^{-1}(x)}{\sqrt{1-x^2}}\,dx\\
&= -\frac{x^2}{4}+\frac{1}{2}x\sqrt{1-x^2}\sin^{-1}(x)+\frac{1}{4}\sin^{-1}(x)^2
\end{aligned}$$

Mathematica [A] time = 0.0083409, size = 30, normalized size = 0.88

$$\frac{1}{4}\left(-x^2+2\sqrt{1-x^2}x\sin^{-1}(x)+\sin^{-1}(x)^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[1 - x^2]*ArcSin[x],x]
```

```
[Out] (-x^2 + 2*x*Sqrt[1 - x^2]*ArcSin[x] + ArcSin[x]^2)/4
```

Maple [A] time = 0.044, size = 31, normalized size = 0.9

$$\frac{\arcsin(x)}{2}\left(x\sqrt{-x^2+1}+\arcsin(x)\right)-\frac{(\arcsin(x))^2}{4}-\frac{x^2}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x)*(-x^2+1)^(1/2),x)
```

```
[Out] 1/2*arcsin(x)*(x*(-x^2+1)^(1/2)+arcsin(x))-1/4*arcsin(x)^2-1/4*x^2
```

Maxima [A] time = 1.5701, size = 41, normalized size = 1.21

$$-\frac{1}{4}x^2+\frac{1}{2}\left(\sqrt{-x^2+1}x+\arcsin(x)\right)\arcsin(x)-\frac{1}{4}\arcsin(x)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/4*x^2 + 1/2*(sqrt(-x^2 + 1)*x + arcsin(x))*arcsin(x) - 1/4*arcsin(x)^2
```

Fricas [A] time = 2.08483, size = 81, normalized size = 2.38

$$\frac{1}{2}\sqrt{-x^2+1}x\arcsin(x)-\frac{1}{4}x^2+\frac{1}{4}\arcsin(x)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(-x^2 + 1)*x*arcsin(x) - 1/4*x^2 + 1/4*arcsin(x)^2
```

Sympy [A] time = 22.1957, size = 48, normalized size = 1.41

$$\left(\begin{cases}\frac{x\sqrt{1-x^2}}{2}+\frac{\operatorname{asin}(x)}{2} & \text{for } x>-1\wedge x<1\end{cases}\right)\operatorname{asin}(x)-\begin{cases}\text{NaN} & \text{for } x<-1\\ \frac{x^2}{4}+\frac{\operatorname{asin}^2(x)}{4}-\frac{\pi^2}{16}-\frac{1}{4} & \text{for } x<1\\ \text{NaN} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x)*(-x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x*sqrt(1 - x**2)/2 + asin(x)/2, (x > -1) & (x < 1)))*asin(x) - P
iecewise((nan, x < -1), (x**2/4 + asin(x)**2/4 - pi**2/16 - 1/4, x < 1), (n
an, True))
```

Giac [A] time = 1.19546, size = 36, normalized size = 1.06

$$\frac{1}{2}\sqrt{-x^2+1}x\arcsin(x) - \frac{1}{4}x^2 + \frac{1}{4}\arcsin(x)^2 + \frac{1}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(-x^2 + 1)*x*arcsin(x) - 1/4*x^2 + 1/4*arcsin(x)^2 + 1/8
```

3.100 $\int \sqrt{\pi - c^2\pi x^2}\left(a + b\sin^{-1}(cx)\right)dx$

Optimal. Leaf size=68

$$\frac{1}{2}x\sqrt{\pi-\pi c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{\pi}\left(a+b\sin^{-1}(cx)\right)^2}{4bc}-\frac{1}{4}\sqrt{\pi}bcx^2$$

```
[Out] -(b*c*Sqrt[Pi]*x^2)/4 + (x*Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]))/2 + (
Sqrt[Pi]*(a + b*ArcSin[c*x])^2)/(4*b*c)
```

Rubi [A] time = 0.0585542, antiderivative size = 116, normalized size of antiderivative = 1.71, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4647, 4641, 30}

$$\frac{1}{2}x\sqrt{\pi-\pi c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{\pi-\pi c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{\pi-\pi c^2x^2}}{4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(b*c*x^2*Sqrt[Pi - c^2*Pi*x^2])/(4*Sqrt[1 - c^2*x^2]) + (x*Sqrt[Pi - c^2*P
i*x^2]*(a + b*ArcSin[c*x]))/2 + (Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x])^
2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int\sqrt{\pi-c^2\pi x^2}\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{2}x\sqrt{\pi-c^2\pi x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{\pi-c^2\pi x^2}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}dx}{2\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{\pi-c^2\right.}{2\sqrt{1-}}$$

$$=-\frac{bcx^2\sqrt{\pi-c^2\pi x^2}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{\pi-c^2\pi x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{\pi-c^2\pi x^2}\left(a+b\sin\right.}{4bc\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.0508784, size = 87, normalized size = 1.28

$$\frac{\sqrt{\pi}\left(a^2+2abcx\sqrt{1-c^2x^2}+2b\sin^{-1}(cx)\left(a+bcx\sqrt{1-c^2x^2}\right)-b^2c^2x^2+b^2\sin^{-1}(cx)^2\right)}{4bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[Pi]*(a^2 - b^2*c^2*x^2 + 2*a*b*c*x*Sqrt[1 - c^2*x^2] + 2*b*(a + b*c*x
*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(4*b*c)
```

Maple [A] time = 0.043, size = 101, normalized size = 1.5

$$\frac{ax}{2}\sqrt{-\pi c^2x^2+\pi}+\frac{a\pi}{2}\arctan\left(x\sqrt{\pi c^2}\frac{1}{\sqrt{-\pi c^2x^2+\pi}}\right)\frac{1}{\sqrt{\pi c^2}}+\frac{b\sqrt{\pi}\arcsin(cx)x}{2}\sqrt{-c^2x^2+1}-\frac{bcx^2\sqrt{\pi}}{4}+\frac{b\sqrt{\pi}(\arcsin}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-Pi*c^2*x^2+Pi)^(1/2),x)
```

```
[Out] 1/2*a*x*(-Pi*c^2*x^2+Pi)^(1/2)+1/2*a*Pi/(Pi*c^2)^(1/2)*arctan((Pi*c^2)^(1/2
)*x/(-Pi*c^2*x^2+Pi)^(1/2))+1/2*b*Pi^(1/2)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x
-1/4*b*c*x^2*Pi^(1/2)+1/4*b*Pi^(1/2)/c*arcsin(c*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\sqrt{\pi}b\int\sqrt{cx+1}\sqrt{-cx+1}\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)dx+\frac{1}{2}\left(\sqrt{\pi-\pi c^2x^2}x+\frac{\pi\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{\pi c^2}}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(pi)*b*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)), x) + 1/2*(sqrt(pi - pi*c^2*x^2)*x + pi*arcsin(c^2*x/sqrt
(c^2))/sqrt(pi*c^2))*a
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\pi-\pi c^2x^2}(b\arcsin(cx)+a),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(pi - pi*c^2*x^2)*(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\sqrt{\pi}\left(\int a\sqrt{-c^2x^2+1}\,dx+\int b\sqrt{-c^2x^2+1}\operatorname{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-pi*c**2*x**2+pi)**(1/2),x)
```

```
[Out] sqrt(pi)*(Integral(a*sqrt(-c**2*x**2 + 1), x) + Integral(b*sqrt(-c**2*x**2
+ 1)*asin(c*x), x))
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.101 $\int \frac{x^4 \sin^{-1}(ax)}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=88

$$\frac{3x^2}{16a^3} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{8a^4} + \frac{3\sin^{-1}(ax)^2}{16a^5} + \frac{x^4}{16a}$$

```
[Out] (3*x^2)/(16*a^3) + x^4/(16*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(8*a^4)
 - (x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) + (3*ArcSin[a*x]^2)/(16*a^5)
```

Rubi [A] time = 0.151599, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4707, 4641, 30}

$$\frac{3x^2}{16a^3} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{8a^4} + \frac{3\sin^{-1}(ax)^2}{16a^5} + \frac{x^4}{16a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (3*x^2)/(16*a^3) + x^4/(16*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(8*a^4)
 - (x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) + (3*ArcSin[a*x]^2)/(16*a^5)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^4\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}dx &= -\frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2} + \frac{3\int \frac{x^2\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}dx}{4a^2} + \frac{\int x^3\,dx}{4a}\\
&= \frac{x^4}{16a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2} + \frac{3\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}dx}{8a^4} + \frac{3\int x\,dx}{8a^3}\\
&= \frac{3x^2}{16a^3} + \frac{x^4}{16a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2} + \frac{3\sin^{-1}(ax)^2}{16a^5}
\end{aligned}$$

Mathematica [A] time = 0.0340756, size = 64, normalized size = 0.73

$$\frac{a^2x^2\left(a^2x^2+3\right)-2ax\sqrt{1-a^2x^2}\left(2a^2x^2+3\right)\sin^{-1}(ax)+3\sin^{-1}(ax)^2}{16a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a^2*x^2*(3 + a^2*x^2) - 2*a*x*Sqrt[1 - a^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x
] + 3*ArcSin[a*x]^2)/(16*a^5)
```

Maple [A] time = 0.057, size = 74, normalized size = 0.8

$$\frac{1}{16\,a^5}\left(-4\,\arcsin(ax)\,\sqrt{-a^2x^2+1}x^3a^3+a^4x^4-6\,\arcsin(ax)\,\sqrt{-a^2x^2+1}xa+3\,a^2x^2+3\,(\arcsin(ax))^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/16*(-4*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x^3*a^3+a^4*x^4-6*arcsin(a*x)*(-a^2
*x^2+1)^(1/2)*x*a+3*a^2*x^2+3*arcsin(a*x)^2)/a^5
```

Maxima [A] time = 1.62586, size = 140, normalized size = 1.59

$$\frac{1}{16}\left(\frac{x^4}{a^2}+\frac{3\,x^2}{a^4}-\frac{3\,\arcsin\left(\frac{a^2x}{\sqrt{a^2}}\right)^2}{a^6}\right)a-\frac{1}{8}\left(\frac{2\,\sqrt{-a^2x^2+1}x^3}{a^2}+\frac{3\,\sqrt{-a^2x^2+1}x}{a^4}-\frac{3\,\arcsin\left(\frac{a^2x}{\sqrt{a^2}}\right)}{\sqrt{a^2}a^4}\right)\arcsin(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/16*(x^4/a^2 + 3*x^2/a^4 - 3*arcsin(a^2*x/sqrt(a^2))^2/a^6)*a - 1/8*(2*sqr
t(-a^2*x^2 + 1)*x^3/a^2 + 3*sqrt(-a^2*x^2 + 1)*x/a^4 - 3*arcsin(a^2*x/sqrt(
a^2))/(sqrt(a^2)*a^4))*arcsin(a*x)
```

Fricas [A] time = 2.08423, size = 142, normalized size = 1.61

$$\frac{a^4x^4+3\,a^2x^2-2\left(2\,a^3x^3+3\,ax\right)\sqrt{-a^2x^2+1}\arcsin(ax)+3\,\arcsin(ax)^2}{16\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/16*(a^4*x^4 + 3*a^2*x^2 - 2*(2*a^3*x^3 + 3*a*x)*sqrt(-a^2*x^2 + 1)*arcsin
(a*x) + 3*arcsin(a*x)^2)/a^5
```

Sympy [A] time = 2.88018, size = 82, normalized size = 0.93

$$\begin{cases} \frac{x^4}{16a} - \frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{4a^2} + \frac{3x^2}{16a^3} - \frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{8a^4} + \frac{3\operatorname{asin}^2(ax)}{16a^5} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**4/(16*a) - x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)/(4*a**2) + 3*x
**2/(16*a**3) - 3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(8*a**4) + 3*asin(a*x)**
2/(16*a**5), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.27659, size = 123, normalized size = 1.4

$$\frac{\left(-a^2x^2+1\right)^{\frac{3}{2}}x\arcsin(ax)}{4a^4} - \frac{5\sqrt{-a^2x^2+1}x\arcsin(ax)}{8a^4} + \frac{\left(a^2x^2-1\right)^2}{16a^5} + \frac{3\arcsin(ax)^2}{16a^5} + \frac{5\left(a^2x^2-1\right)}{16a^5} + \frac{17}{128a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arcsi
n(a*x)/a^4 + 1/16*(a^2*x^2 - 1)^2/a^5 + 3/16*arcsin(a*x)^2/a^5 + 5/16*(a^2*
x^2 - 1)/a^5 + 17/128/a^5
```

3.102 $\int \frac{x^3 \sin^{-1}(ax)}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=72

$$-\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^2}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^4}+\frac{2x}{3a^3}+\frac{x^3}{9a}$$

```
[Out] (2*x)/(3*a^3) + x^3/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^4) - (x^
2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^2)
```

Rubi [A] time = 0.107182, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4707, 4677, 8, 30}

$$-\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^2}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^4}+\frac{2x}{3a^3}+\frac{x^3}{9a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*x)/(3*a^3) + x^3/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^4) - (x^
2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^2)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^3 \sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^2} + \frac{2\int \frac{x\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx}{3a^2} + \frac{\int x^2\,dx}{3a}$$
$$= \frac{x^3}{9a} - \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^2} + \frac{2\int 1\,dx}{3a^3}$$
$$= \frac{2x}{3a^3} + \frac{x^3}{9a} - \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{3a^2}$$

Mathematica [A] time = 0.0247226, size = 49, normalized size = 0.68

$$\frac{ax\left(a^2x^2+6\right)-3\sqrt{1-a^2x^2}\left(a^2x^2+2\right)\sin^{-1}(ax)}{9a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a*x*(6 + a^2*x^2) - 3*Sqrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin[a*x])/(9*a^4)
```

Maple [A] time = 0.046, size = 95, normalized size = 1.3

$$-\frac{1}{9\,a^4\left(a^2x^2-1\right)}\left(3\,a^4x^4\arcsin(ax)+3\,a^2x^2\arcsin(ax)+a^3x^3\sqrt{-a^2x^2+1}-6\,\arcsin(ax)+6\,ax\sqrt{-a^2x^2+1}\right)\sqrt{-a^2x^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/9/a^4*(3*a^4*x^4*arcsin(a*x)+3*a^2*x^2*arcsin(a*x)+a^3*x^3*(-a^2*x^2+1)^
(1/2)-6*arcsin(a*x)+6*a*x*(-a^2*x^2+1)^(1/2))*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1
)
```

Maxima [A] time = 1.56754, size = 82, normalized size = 1.14

$$\frac{1}{9}\,a\left(\frac{x^3}{a^2}+\frac{6\,x}{a^4}\right)-\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}x^2}{a^2}+\frac{2\,\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/9*a*(x^3/a^2 + 6*x/a^4) - 1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x
^2 + 1)/a^4)*arcsin(a*x)
```

Fricas [A] time = 2.07645, size = 103, normalized size = 1.43

$$\frac{a^3x^3-3\left(a^2x^2+2\right)\sqrt{-a^2x^2+1}\arcsin(ax)+6\,ax}{9\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/9*(a^3*x^3 - 3*(a^2*x^2 + 2)*sqrt(-a^2*x^2 + 1)*arcsin(a*x) + 6*a*x)/a^4
```

Sympy [A] time = 1.57694, size = 65, normalized size = 0.9

$$\begin{cases} \frac{x^3}{9a} - \frac{x^2\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{3a^2} + \frac{2x}{3a^3} - \frac{2\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{3a^4} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**3/(9*a) - x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(3*a**2) + 2*x/
(3*a**3) - 2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(3*a**4), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.22243, size = 72, normalized size = 1.

$$\frac{a^2x^3 + 6\,x}{9\,a^3} + \frac{\left(\left(-a^2x^2+1\right)^{\frac{3}{2}} - 3\,\sqrt{-a^2x^2+1}\right)\arcsin(ax)}{3\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/9*(a^2*x^3 + 6*x)/a^3 + 1/3*((-a^2*x^2 + 1)^(3/2) - 3*sqrt(-a^2*x^2 + 1))
*arcsin(a*x)/a^4
```

3.103 $\int \frac{x^2 \sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=50

$$-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2a^2}+\frac{\sin^{-1}(ax)^2}{4a^3}+\frac{x^2}{4a}$$

```
[Out] x^2/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*a^2) + ArcSin[a*x]^2/(4*a^
3)
```

Rubi [A] time = 0.0818071, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4707, 4641, 30}

$$-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2a^2}+\frac{\sin^{-1}(ax)^2}{4a^3}+\frac{x^2}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x^2/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*a^2) + ArcSin[a*x]^2/(4*a^
3)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx &= -\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2a^2}+\frac{\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx}{2a^2}+\frac{\int x\,dx}{2a}\\ &= \frac{x^2}{4a}-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2a^2}+\frac{\sin^{-1}(ax)^2}{4a^3}\end{aligned}$$

Mathematica [A] time = 0.0110443, size = 43, normalized size = 0.86

$$\frac{a^2x^2 - 2ax\sqrt{1-a^2x^2}\sin^{-1}(ax) + \sin^{-1}(ax)^2}{4a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a^2*x^2 - 2*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + ArcSin[a*x]^2)/(4*a^3)
```

Maple [A] time = 0.046, size = 40, normalized size = 0.8

$$\frac{1}{4a^3}\left(-2\arcsin(ax)\sqrt{-a^2x^2+1}xa + a^2x^2 + (\arcsin(ax))^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/4*(-2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x*a+a^2*x^2+arcsin(a*x)^2)/a^3
```

Maxima [A] time = 1.58923, size = 101, normalized size = 2.02

$$\frac{1}{4}a\left(\frac{x^2}{a^2} - \frac{\arcsin\left(\frac{a^2x}{\sqrt{a^2}}\right)^2}{a^4}\right) - \frac{1}{2}\left(\frac{\sqrt{-a^2x^2+1}x}{a^2} - \frac{\arcsin\left(\frac{a^2x}{\sqrt{a^2}}\right)}{\sqrt{a^2}a^2}\right)\arcsin(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*a*(x^2/a^2 - arcsin(a^2*x/sqrt(a^2))^2/a^4) - 1/2*(sqrt(-a^2*x^2 + 1)*x
/a^2 - arcsin(a^2*x/sqrt(a^2))/(sqrt(a^2)*a^2))*arcsin(a*x)
```

Fricas [A] time = 2.04795, size = 100, normalized size = 2.

$$\frac{a^2x^2 - 2\sqrt{-a^2x^2+1}ax\arcsin(ax) + \arcsin(ax)^2}{4a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*(a^2*x^2 - 2*sqrt(-a^2*x^2 + 1)*a*x*arcsin(a*x) + arcsin(a*x)^2)/a^3
```

Sympy [A] time = 0.931884, size = 42, normalized size = 0.84

$$\begin{cases} \frac{x^2}{4a} - \frac{x\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{2a^2} + \frac{\operatorname{asin}^2(ax)}{4a^3} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**2/(4*a) - x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(2*a**2) + asin(a*
x)**2/(4*a**3), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.38191, size = 72, normalized size = 1.44

$$-\frac{\sqrt{-a^2x^2+1}x\arcsin(ax)}{2a^2}+\frac{\arcsin(ax)^2}{4a^3}+\frac{a^2x^2-1}{4a^3}+\frac{1}{8a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)/a^2 + 1/4*arcsin(a*x)^2/a^3 + 1/4*(a^
2*x^2 - 1)/a^3 + 1/8/a^3
```

3.104 $\int \frac{x\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=29

$$\frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2}$$

```
[Out] x/a - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2
```

Rubi [A] time = 0.0405081, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {4677, 8}

$$\frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x/a - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\begin{aligned}\int \frac{x\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2}+\frac{\int 1\,dx}{a}\\ &= \frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2}\end{aligned}$$

Mathematica [A] time = 0.0083922, size = 29, normalized size = 1.

$$\frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x/a - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2
```

Maple [B] time = 0.038, size = 62, normalized size = 2.1

$$-\frac{1}{a^2\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}\left(a^2x^2\arcsin\left(ax\right)-\arcsin\left(ax\right)+ax\sqrt{-a^2x^2+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(a^2*x^2*arcsin(a*x)-arcsin(a*x)+a*x*
(-a^2*x^2+1)^(1/2))
```

Maxima [A] time = 1.53852, size = 36, normalized size = 1.24

$$\frac{x}{a}-\frac{\sqrt{-a^2x^2+1}\arcsin\left(ax\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] x/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/a^2
```

Fricas [A] time = 2.13272, size = 59, normalized size = 2.03

$$\frac{ax-\sqrt{-a^2x^2+1}\arcsin\left(ax\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (a*x - sqrt(-a^2*x^2 + 1)*arcsin(a*x))/a^2
```

Sympy [A] time = 0.521907, size = 24, normalized size = 0.83

$$\begin{cases} \frac{x}{a}-\frac{\sqrt{-a^2x^2+1}\operatorname{asin}\left(ax\right)}{a^2} & \text{for}\ a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x/a - sqrt(-a**2*x**2 + 1)*asin(a*x)/a**2, Ne(a, 0)), (0, True))
```

<u>Giac</u> [A] time = 1.40187, size = 36, normalized size = 1.24

$$\frac{x}{a} - \frac{\sqrt{-a^2x^2 + 1}\arcsin(ax)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] x/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/a^2
```

3.105 $\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}} \, dx$

Optimal. Leaf size=13

$$\frac{\sin^{-1}(ax)^2}{2a}$$

[Out] ArcSin[a*x]^2/(2*a)

Rubi [A] time = 0.0197116, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4641}

$$\frac{\sin^{-1}(ax)^2}{2a}$$

Antiderivative was successfully verified.

[In] Int[ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]

[Out] ArcSin[a*x]^2/(2*a)

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}} \, dx = \frac{\sin^{-1}(ax)^2}{2a}$$

Mathematica [A] time = 0.0052022, size = 13, normalized size = 1.

$$\frac{\sin^{-1}(ax)^2}{2a}$$

Antiderivative was successfully verified.

[In] Integrate[ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]

[Out] ArcSin[a*x]^2/(2*a)

Maple [A] time = 0.004, size = 12, normalized size = 0.9

$$\frac{(\arcsin(ax))^2}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/2*arcsin(a*x)^2/a
```

Maxima [A] time = 1.58512, size = 15, normalized size = 1.15

$$\frac{\arcsin(ax)^2}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*arcsin(a*x)^2/a
```

Fricas [A] time = 1.95283, size = 28, normalized size = 2.15

$$\frac{\arcsin(ax)^2}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*arcsin(a*x)^2/a
```

Sympy [A] time = 0.438713, size = 10, normalized size = 0.77

$$\begin{cases} \frac{\operatorname{asin}^2(ax)}{2a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((asin(a*x)**2/(2*a), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.27013, size = 15, normalized size = 1.15

$$\frac{\arcsin(ax)^2}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*arcsin(a*x)^2/a
```

3.106 $\int \frac{\sin^{-1}(ax)}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=52

$$i\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-i\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)$$

```
[Out] -2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] + I*PolyLog[2, -E^(I*ArcSin[a*x])
] - I*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rubi [A] time = 0.0839628, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4709, 4183, 2279, 2391}

$$i\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-i\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] + I*PolyLog[2, -E^(I*ArcSin[a*x])
] - I*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)}{x\sqrt{1-a^2x^2}}\,dx = \text{Subst}\left(\int x\csc(x)\,dx, x, \sin^{-1}(ax)\right)$$
$$= -2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - \text{Subst}\left(\int \log\left(1-e^{ix}\right)dx, x, \sin^{-1}(ax)\right) + \text{Subst}\left(\int \log\left(1+\right.\right.$$
$$= -2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + i\,\text{Subst}\left(\int \frac{\log(1-x)}{x}dx, x, e^{i\sin^{-1}(ax)}\right) - i\,\text{Subst}\left(\int \frac{\log(1+}{x}\right.$$
$$= -2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + i\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - i\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right)$$

Mathematica [A] time = 0.0921003, size = 71, normalized size = 1.37

$$i\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right) - i\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right) + \sin^{-1}(ax)\left(\log\left(1-e^{i\sin^{-1}(ax)}\right) - \log\left(1+e^{i\sin^{-1}(ax)}\right)\right)$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] ArcSin[a*x]*(Log[1 - E^(I*ArcSin[a*x])] - Log[1 + E^(I*ArcSin[a*x])]) + I*P
olyLog[2, -E^(I*ArcSin[a*x])] - I*PolyLog[2, E^(I*ArcSin[a*x])]
```

Maple [A] time = 0.085, size = 103, normalized size = 2.

$$-\arcsin(ax)\ln\left(1+iax+\sqrt{-a^2x^2+1}\right) + \arcsin(ax)\ln\left(1-iax-\sqrt{-a^2x^2+1}\right) + i\text{polylog}\left(2,-iax-\sqrt{-a^2x^2+1}\right) -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -arcsin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+arcsin(a*x)*ln(1-I*a*x-(-a^2*x^
2+1)^(1/2))+I*polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))-I*polylog(2,I*a*x+(-a^2*
x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)}{a^2x^3-x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)/(a^2*x^3 - x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x), x)
```

3.107 $\int \frac{\sin^{-1}(ax)}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=28

$$a\log(x)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{x}$$

```
[Out] -((Sqrt[1 - a^2*x^2]*ArcSin[a*x])/x) + a*Log[x]
```

Rubi [A] time = 0.0611197, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4681, 29}

$$a\log(x)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -((Sqrt[1 - a^2*x^2]*ArcSin[a*x])/x) + a*Log[x]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)}{x^2\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{x}+a\int \frac{1}{x}\,dx\\ &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{x}+a\log(x)\end{aligned}$$

Mathematica [A] time = 0.0241364, size = 28, normalized size = 1.

$$a\log(x)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -((Sqrt[1 - a^2*x^2]*ArcSin[a*x])/x) + a*Log[x]
```

Maple [A] time = 0.045, size = 32, normalized size = 1.1

$$-\frac{1}{x}\left(-\ln\left(ax\right)ax+\arcsin\left(ax\right)\sqrt{-a^{2}x^{2}+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -(-ln(a*x)*a*x+arcsin(a*x)*(-a^2*x^2+1)^(1/2))/x
```

Maxima [A] time = 1.5734, size = 35, normalized size = 1.25

$$a\log\left(x\right)-\frac{\sqrt{-a^{2}x^{2}+1}\arcsin\left(ax\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] a*log(x) - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/x
```

Fricas [A] time = 2.19825, size = 66, normalized size = 2.36

$$\frac{ax\log\left(x\right)-\sqrt{-a^{2}x^{2}+1}\arcsin\left(ax\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (a*x*log(x) - sqrt(-a^2*x^2 + 1)*arcsin(a*x))/x
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{asin}\left(ax\right)}{x^{2}\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/x**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

<u>Giac</u> [B] time = 1.38837, size = 99, normalized size = 3.54

$$\frac{1}{2}\left(\frac{a^4x}{\left(\sqrt{-a^2x^2+1}|a|+a\right)|a|}-\frac{\sqrt{-a^2x^2+1}|a|+a}{x|a|}\right)\arcsin\left(ax\right)+\frac{1}{2}\,a\log\left(a^2x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*(a^4*x/((sqrt(-a^2*x^2 + 1)*abs(a) + a)*abs(a)) - (sqrt(-a^2*x^2 + 1)*a
bs(a) + a)/(x*abs(a)))*arcsin(a*x) + 1/2*a*log(a^2*x^2)
```

3.108 $\int \frac{\sin^{-1}(ax)}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=98

$$\frac{1}{2}ia^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-\frac{1}{2}ia^2\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2x^2}+a^2\left(-\sin^{-1}(ax)\right)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)$$

```
[Out] -a/(2*x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*x^2) - a^2*ArcSin[a*x]*ArcTan
h[E^(I*ArcSin[a*x])] + (I/2)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (I/2)*a^2
*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rubi [A] time = 0.146777, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4701, 4709, 4183, 2279, 2391, 30}

$$\frac{1}{2}ia^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-\frac{1}{2}ia^2\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2x^2}+a^2\left(-\sin^{-1}(ax)\right)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -a/(2*x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*x^2) - a^2*ArcSin[a*x]*ArcTan
h[E^(I*ArcSin[a*x])] + (I/2)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (I/2)*a^2
*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)}{x^3\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2x^2}+\frac{1}{2}a\int \frac{1}{x^2}\,dx+\frac{1}{2}a^2\int \frac{\sin^{-1}(ax)}{x\sqrt{1-a^2x^2}}\,dx\\ &= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2x^2}+\frac{1}{2}a^2\,\mathrm{Subst}\left(\int x\csc(x)\,dx,x,\sin^{-1}(ax)\right)\\ &= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2x^2}-a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)-\frac{1}{2}a^2\,\mathrm{Subst}\left(\int \log\left(1-e^{ix}\right)dx,\right.\\ &= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2x^2}-a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)+\frac{1}{2}\left(ia^2\right)\mathrm{Subst}\left(\int \frac{\log(1-x)}{x}\,dx\right.\\ &= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)}{2x^2}-a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)+\frac{1}{2}ia^2\mathrm{Li}_2\left(-e^{i\sin^{-1}(ax)}\right)-\frac{1}{2}ia^2\mathrm{Li}_2\end{aligned}$$

Mathematica [A] time = 0.838323, size = 137, normalized size = 1.4

$$\frac{1}{8}a^2\left(4i\mathrm{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-4i\mathrm{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)+4\sin^{-1}(ax)\log\left(1-e^{i\sin^{-1}(ax)}\right)-4\sin^{-1}(ax)\log\left(1+e^{i}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*(-2*Cot[ArcSin[a*x]/2] - ArcSin[a*x]*Csc[ArcSin[a*x]/2]^2 + 4*ArcSin[a
*x]*Log[1 - E^(I*ArcSin[a*x])] - 4*ArcSin[a*x]*Log[1 + E^(I*ArcSin[a*x])] +
 (4*I)*PolyLog[2, -E^(I*ArcSin[a*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[a*x])]
 + ArcSin[a*x]*Sec[ArcSin[a*x]/2]^2 - 2*Tan[ArcSin[a*x]/2]))/8
```

Maple [A] time = 0.172, size = 178, normalized size = 1.8

$$-\frac{1}{\left(2a^2x^2-2\right)x^2}\sqrt{-a^2x^2+1}\left(a^2x^2\arcsin(ax)-ax\sqrt{-a^2x^2+1}-\arcsin(ax)\right)-\frac{a^2\arcsin(ax)}{2}\ln\left(1+iax+\sqrt{-a^2x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*(a^2*x^2*arcsin(a*x)-a*x*(-a^2*x^2+
1)^(1/2)-arcsin(a*x))-1/2*a^2*arcsin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+1/
2*a^2*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))+1/2*I*a^2*polylog(2,-I*a*x
```

```
-(-a^2*x^2+1)^(1/2))-1/2*I*a^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)}{a^2x^5-x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)/(a^2*x^5 - x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}(ax)}{x^3\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/x**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

3.109 $\int \frac{x^5(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=224

$$-\frac{x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d}-\frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15c^4d}-\frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15c^6d}+\frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx}}$$

```
[Out] (8*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (4*b*x^3*Sqrt[1 -
c^2*x^2])/(45*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^5*Sqrt[1 - c^2*x^2])/(25*c*Sq
rt[d - c^2*d*x^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^6*d)
 - (4*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^4*d) - (x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

Rubi [A] time = 0.26524, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4707, 4677, 8, 30}

$$-\frac{x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d}-\frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15c^4d}-\frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15c^6d}+\frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (8*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (4*b*x^3*Sqrt[1 -
c^2*x^2])/(45*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^5*Sqrt[1 - c^2*x^2])/(25*c*Sq
rt[d - c^2*d*x^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^6*d)
 - (4*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^4*d) - (x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^5 \left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d} + \frac{4\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{5c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x^4\,dx}{5c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c^2d} + \frac{8\int}{}$$

$$= \frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\right.}{15c^4d}$$

$$= \frac{8bx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15c^6d} - \frac{4x^2}{}$$

Mathematica [A] time = 0.0723077, size = 119, normalized size = 0.53

$$\frac{15a\left(3c^6x^6+c^4x^4+4c^2x^2-8\right)+bcx\sqrt{1-c^2x^2}\left(9c^4x^4+20c^2x^2+120\right)+15b\left(3c^6x^6+c^4x^4+4c^2x^2-8\right)\sin^{-1}(cx)}{225c^6\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4*x^4) + 15*a*(-8 + 4*c^2*
x^2 + c^4*x^4 + 3*c^6*x^6) + 15*b*(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6)*Ar
cSin[c*x])/(225*c^6*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.369, size = 665, normalized size = 3.

$$a\left(-\frac{x^4}{5c^2d}\sqrt{-c^2dx^2+d}+\frac{4}{5c^2}\left(-\frac{x^2}{3c^2d}\sqrt{-c^2dx^2+d}-\frac{2}{3dc^4}\sqrt{-c^2dx^2+d}\right)\right)+b\left(-\frac{i+5\arcsin(cx)}{800\,dc^6\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(16c^6\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] a*(-1/5*x^4/c^2/d*(-c^2*d*x^2+d)^(1/2)+4/5/c^2*(-1/3*x^2/c^2/d*(-c^2*d*x^2+
d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2)))+b*(-1/800*(-d*(c^2*x^2-1))^(1/2)*
(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^
2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))/c^6/
d/(c^2*x^2-1)-5/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))/c^6/d/(
c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)
*(arcsin(c*x)+I)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/d/(c^2*x^2-1)-5/288*(-d*(c^2*x
^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/
2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^6/d/(c^2*x^2-1)-1/800*(-d*(c^2*x^2
-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1
/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsi
```

```
n(c*x))/c^6/d/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.15844, size = 328, normalized size = 1.46

$$-\frac{\left(9\,bc^5x^5+20\,bc^3x^3+120\,bcx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+15\left(3\,ac^6x^6+ac^4x^4+4\,ac^2x^2+\left(3\,bc^6x^6+bc^4x^4+4\,bc^2x^2\right.\right.}{225\left(c^8dx^2-c^6d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/225*((9*b*c^5*x^5 + 20*b*c^3*x^3 + 120*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(
-c^2*x^2 + 1) + 15*(3*a*c^6*x^6 + a*c^4*x^4 + 4*a*c^2*x^2 + (3*b*c^6*x^6 +
b*c^4*x^4 + 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^
8*d*x^2 - c^6*d)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5\,(a+b\,\mathrm{asin}\,(cx))}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)x^5}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^5/sqrt(-c^2*d*x^2 + d), x)
```

3.110 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=200

$$-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4c^2d}-\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^4d}+\frac{3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc^5\sqrt{d-c^2dx^2}}+\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}}+$$

```
[Out] (3*b*x^2*Sqrt[1 - c^2*x^2])/(16*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 -
c^2*x^2])/(16*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcS
in[c*x]))/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(4*c^2*
d) + (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^5*Sqrt[d - c^2*d*x
^2])
```

Rubi [A] time = 0.249813, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4707, 4643, 4641, 30}

$$-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4c^2d}-\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^4d}+\frac{3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc^5\sqrt{d-c^2dx^2}}+\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}}+$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```


```
[Out] (3*b*x^2*Sqrt[1 - c^2*x^2])/(16*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 -
c^2*x^2])/(16*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcS
in[c*x]))/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(4*c^2*
d) + (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^5*Sqrt[d - c^2*d*x
^2])
```


Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4c^2d}+\frac{3\int\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{4c^2}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int x^3\,dx}{4c\sqrt{d-c^2dx^2}}$$

$$=\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^4d}-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{4c^2d}+\frac{3\int$$

$$=\frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}}+\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^4d}-\frac{x^3\sqrt{d-c^2dx^2}\left(a+\right.}{4c^2d}$$

$$=\frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}}+\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^4d}-\frac{x^3\sqrt{d-c^2dx^2}\left(a+\right.}{4c^2d}$$

Mathematica [A] time = 0.804621, size = 161, normalized size = 0.8

$$\frac{-\frac{16acx\left(2c^2x^2+3\right)\sqrt{d-c^2dx^2}}{d}-\frac{48a\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(c^2x^2-1\right)}\right)}{\sqrt{d}}+\frac{b\sqrt{1-c^2x^2}\left(4\sin^{-1}(cx)\left(6\sin^{-1}(cx)-8\sin\left(2\sin^{-1}(cx)\right)+\sin\left(4\sin^{-1}(cx)\right)\right)-16\cos\left(2\sin^{-1}(cx)\right)+c\right.}{\sqrt{d-c^2dx^2}}}{128c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] ((-16*a*c*x*(3 + 2*c^2*x^2)*Sqrt[d - c^2*d*x^2])/d - (48*a*ArcTan[(c*x*Sqrt
[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))])/Sqrt[d] + (b*Sqrt[1 - c^2*x^2]*
(-16*Cos[2*ArcSin[c*x]] + Cos[4*ArcSin[c*x]] + 4*ArcSin[c*x]*(6*ArcSin[c*x]
 - 8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/Sqrt[d - c^2*d*x^2])/(128*c
^5)
```

Maple [B] time = 0.332, size = 400, normalized size = 2.

$$-\frac{ax^3}{4c^2d}\sqrt{-c^2dx^2+d}-\frac{3ax}{8c^4d}\sqrt{-c^2dx^2+d}+\frac{3a}{8c^4}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{b\arcsin(cx)x^5}{4d\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -1/4*a*x^3/c^2/d*(-c^2*d*x^2+d)^(1/2)-3/8*a/c^4*x/d*(-c^2*d*x^2+d)^(1/2)+3/
8*a/c^4/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/4*b*(-
d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*x^5-1/8*b*(-d*(c^2*x^2-1))^(
1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)*x^3+3/8*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(
c^2*x^2-1)*arcsin(c*x)*x+15/128*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*
(-c^2*x^2+1)^(1/2)-3/16*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(
c^2*x^2-1)*arcsin(c*x)^2-1/16*b*(-d*(c^2*x^2-1))^(1/2)/c/d/(c^2*x^2-1)*(-c^
2*x^2+1)^(1/2)*x^4-3/16*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(bx^4\arcsin\left(cx\right)+ax^4\right)\sqrt{-c^2dx^2+d}}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^2*d*x^2 - d),
 x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^4\left(a+b\,\text{asin}\left(cx\right)\right)}{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)x^4}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/sqrt(-c^2*d*x^2 + d), x)
```

3.111 $\int \frac{x^3(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=148

$$-\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d}+\frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}$$

```
[Out] (2*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^3*Sqrt[1 - c^2
*x^2])/(9*c*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(3*c^4*d) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^2*d)
```

Rubi [A] time = 0.159491, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4707, 4677, 8, 30}

$$-\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d}-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d}+\frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^3*Sqrt[1 - c^2
*x^2])/(9*c*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(3*c^4*d) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^2*d)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d} + \frac{2\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{3c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x^2\,dx}{3c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d} - \frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^2d} + \frac{\left(2b\sqrt{1-\right.}{3c^3\sqrt{}}$$

$$= \frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d} - \frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{3c^2d}$$

Mathematica [A] time = 0.0523435, size = 92, normalized size = 0.62

$$\frac{3a\left(c^4x^4+c^2x^2-2\right)+bcx\sqrt{1-c^2x^2}\left(c^2x^2+6\right)+3b\left(c^4x^4+c^2x^2-2\right)\sin^{-1}(cx)}{9c^4\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2]*(6 + c^2*x^2) + 3*a*(-2 + c^2*x^2 + c^4*x^4) + 3*b
*(-2 + c^2*x^2 + c^4*x^4)*ArcSin[c*x])/(9*c^4*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.24, size = 381, normalized size = 2.6

$$a\left(-\frac{x^2}{3\,c^2d}\sqrt{-c^2dx^2+d}-\frac{2}{3\,dc^4}\sqrt{-c^2dx^2+d}\right)+b\left(-\frac{i+3\,\arcsin(cx)}{72\,dc^4\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(4\,c^4x^4-5\,c^2x^2-4\,i\sqrt{-c^2x^2+1}x^3c^3\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] a*(-1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+b*(-
1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3
*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*
(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)
/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2
*x^2-1)*(arcsin(c*x)-I)/c^4/d/(c^2*x^2-1)-1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1
)*(-I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.8392, size = 255, normalized size = 1.72

$$-\frac{\left(bc^3x^3+6\,bcx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+3\left(ac^4x^4+ac^2x^2+\left(bc^4x^4+bc^2x^2-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{-c^2dx^2+d}}{9\left(c^6dx^2-c^4d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/9*((b*c^3*x^3 + 6*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3*(a*
c^4*x^4 + a*c^2*x^2 + (b*c^4*x^4 + b*c^2*x^2 - 2*b)*arcsin(c*x) - 2*a)*sqrt
(-c^2*d*x^2 + d))/(c^6*d*x^2 - c^4*d)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3\left(a+b\,\mathrm{asin}\left(cx\right)\right)}{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\arcsin\left(cx\right)+a\right)x^3}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/sqrt(-c^2*d*x^2 + d), x)
```

3.112 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=124

$$-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^2d}+\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc^3\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}$$

```
[Out] (b*x^2*Sqrt[1 - c^2*x^2])/(4*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
)/(4*b*c^3*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.145509, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4707, 4643, 4641, 30}

$$-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^2d}+\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc^3\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*x^2*Sqrt[1 - c^2*x^2])/(4*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
)/(4*b*c^3*Sqrt[d - c^2*d*x^2])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{2c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x\,dx}{2c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c^2\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^2d} + \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc^3\sqrt{d-c^2dx^2}}$$

Mathematica [A] time = 1.03077, size = 134, normalized size = 1.08

$$-\frac{\frac{4acx\sqrt{d-c^2dx^2}}{d} + \frac{4a\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(c^2x^2-1)}\right)}{\sqrt{d}} + \frac{b\sqrt{1-c^2x^2}\left(-2\sin^{-1}(cx)^2+2\sin\left(2\sin^{-1}(cx)\right)\sin^{-1}(cx)+\cos\left(2\sin^{-1}(cx)\right)\right)}{\sqrt{d-c^2dx^2}}}{8c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] -((4*a*c*x*Sqrt[d - c^2*d*x^2])/d + (4*a*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(
Sqrt[d]*(-1 + c^2*x^2))])/Sqrt[d] + (b*Sqrt[1 - c^2*x^2]*(-2*ArcSin[c*x]^2
+ Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]]))/Sqrt[d - c^2*d*x^
2])/(8*c^3)
```

Maple [B] time = 0.186, size = 285, normalized size = 2.3

$$-\frac{ax}{2\,c^2d}\sqrt{-c^2dx^2+d} + \frac{a}{2\,c^2}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}} - \frac{b\left(\arcsin(cx)\right)^2}{4\,dc^3\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1} - \frac{b\,\mathrm{arcs}}{2\,d\,(c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -1/2*a*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2*a/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/4*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-
1)*arcsin(c*x)*x^3-1/4*b*(-d*(c^2*x^2-1))^(1/2)/c/d/(c^2*x^2-1)*(-c^2*x^2+1
)^(1/2)*x^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)*x+1/
8*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(bx^2\arcsin\left(cx\right)+ax^2\right)}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^2*d*x^2 - d),
 x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\operatorname{asin}\left(cx\right)\right)}{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)x^2}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/sqrt(-c^2*d*x^2 + d), x)
```

3.113 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=67

$$\frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^2d}$$

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/(c^2*d)
```

Rubi [A] time = 0.0605404, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.08, Rules used = {4677, 8}

$$\frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/(c^2*d)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\begin{aligned}\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx &= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^2d}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int 1\,dx}{c\sqrt{d-c^2dx^2}}\\ &= \frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^2d}\end{aligned}$$

Mathematica [A] time = 0.0315414, size = 64, normalized size = 0.96

$$\frac{a\left(c^2x^2-1\right)+bcx\sqrt{1-c^2x^2}+b\left(c^2x^2-1\right)\sin^{-1}(cx)}{c^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2] + a*(-1 + c^2*x^2) + b*(-1 + c^2*x^2)*ArcSin[c*x])
/(c^2*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.093, size = 159, normalized size = 2.4

$$-\frac{a}{c^2d}\sqrt{-c^2dx^2+d}+b\left(-\frac{\arcsin(cx)+i}{2\,c^2d\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(c^2x^2-i\sqrt{-c^2x^2+1}xc-1\right)-\frac{\arcsin(cx)-i}{2\,c^2d\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(i\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -a/c^2/d*(-c^2*d*x^2+d)^(1/2)+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c
^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^2/d/(c^2*x^
2-1))
```

Maxima [A] time = 1.68097, size = 78, normalized size = 1.16

$$\frac{bx}{c\sqrt{d}}-\frac{\sqrt{-c^2dx^2+d}b\arcsin(cx)}{c^2d}-\frac{\sqrt{-c^2dx^2+d}a}{c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*x/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*
x^2 + d)*a/(c^2*d)
```

Fricas [A] time = 1.80182, size = 188, normalized size = 2.81

$$-\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx+\left(ac^2x^2+\left(bc^2x^2-b\right)\arcsin(cx)-a\right)\sqrt{-c^2dx^2+d}}{c^4dx^2-c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x + (a*c^2*x^2 + (b*c^2*x^2 -
 b)*arcsin(c*x) - a)*sqrt(-c^2*d*x^2 + d))/(c^4*d*x^2 - c^2*d)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin (cx) + a)x}{\sqrt{-c^2dx^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/sqrt(-c^2*d*x^2 + d), x)
```

3.114 $\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=49

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d-c^2dx^2}}$$

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.0508182, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d - c^2*d*x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\ &= \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] time = 0.0615352, size = 50, normalized size = 1.02

$$\frac{\sqrt{1-c^2x^2}\sin^{-1}(cx)\left(2a+b\sin^{-1}(cx)\right)}{2c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(2*a + b*ArcSin[c*x]))/(2*c*Sqrt[d - c^2*d*x
^2])
```

Maple [A] time = 0.038, size = 86, normalized size = 1.8

$$a\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{b\left(\arcsin\left(cx\right)\right)^2}{2\,dc\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] a/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*b*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin\left(cx\right)+a)}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\,\text{asin}\left(cx\right)}{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\sqrt{-c^2dx^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

3.115 $\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=145

$$\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin\right.}{\sqrt{d-c^2dx^2}}$$

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[
d - c^2*d*x^2] + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sq
rt[d - c^2*d*x^2]
```

Rubi [A] time = 0.193626, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4713, 4709, 4183, 2279, 2391}

$$\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)\left(a+b\sin\right.}{\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[
d - c^2*d*x^2] + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sq
rt[d - c^2*d*x^2]
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$
$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}$$
$$= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \text{si}\right.}{\sqrt{d-c^2dx^2}}$$
$$= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{\left(ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\sin^{-1}}\right.}{\sqrt{d-c^2dx^2}}$$
$$= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ib\sqrt{1-c^2x^2}\,\text{I}}{\sqrt{d-}}$$

Mathematica [A] time = 0.290129, size = 146, normalized size = 1.01

$$\frac{b\sqrt{1-c^2x^2}\left(i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)\left(\log\left(1-e^{i\sin^{-1}(cx)}\right)-\log\left(1+e^{i\sin^{-1}(cx)}\right)\right)\right)}{\sqrt{d\left(1-c^2x^2\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (a*Log[x])/Sqrt[d] - (a*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/Sqrt[d]
 + (b*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 +
E^(I*ArcSin[c*x])]) + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*
ArcSin[c*x])]))/Sqrt[d*(1 - c^2*x^2)]
```

Maple [A] time = 0.101, size = 180, normalized size = 1.2

$$-a\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)\frac{1}{\sqrt{d}} - \frac{ib}{d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}\sqrt{-d\left(c^2x^2-1\right)}\left(i\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -a/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-I*b*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2
))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))/d/(c^2*x^2-1)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^2dx^3-dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^3 - d*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\,\text{asin}\,(cx)}{x\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*x), x)
```

3.116 $\int \frac{a+b\sin^{-1}(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=66

$$\frac{bc\sqrt{1-c^2x^2}\log(x)}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{dx}$$

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(d*x)) + (b*c*Sqrt[1 - c^2*x^2]
*Log[x])/Sqrt[d - c^2*d*x^2]
```

Rubi [A] time = 0.0904784, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {4681, 29}

$$\frac{bc\sqrt{1-c^2x^2}\log(x)}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{dx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(d*x)) + (b*c*Sqrt[1 - c^2*x^2]
*Log[x])/Sqrt[d - c^2*d*x^2]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx&=-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{dx}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x}\,dx}{\sqrt{d-c^2dx^2}}\\&=-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{dx}+\frac{bc\sqrt{1-c^2x^2}\log(x)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] time = 0.124217, size = 69, normalized size = 1.05

$$\frac{bc\log(x)\sqrt{d-c^2dx^2}}{d\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(d*x)) + (b*c*Sqrt[d - c^2*d*x^
2]*Log[x])/(d*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.148, size = 216, normalized size = 3.3

$$-\frac{a}{dx}\sqrt{-c^2dx^2+d}+\frac{ib\arcsin(cx)c}{d(c^2x^2-1)}\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}-\frac{b\arcsin(cx)xc^2}{d(c^2x^2-1)}\sqrt{-d(c^2x^2-1)}+\frac{b\arcsin(cx)}{(c^2x^2-1)dx}\sqrt{-d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(1/2)+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d
/(c^2*x^2-1)*arcsin(c*x)*c-b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d*x/(c^2*x^
2-1)*c^2+b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d/x/(c^2*x^2-1)-b*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^
2-1)*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.09764, size = 487, normalized size = 7.38

$$\left[\frac{bc\sqrt{d}x\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-2\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{2dx}, \frac{bc\sqrt{-d}x\arctan\left(\frac{\sqrt{-c^2dx^2+}}{c^2d}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*(b*c*sqrt(d)*x*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4 - sqrt(-c^2*d*x^2 +
d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 - x^2)) - 2*sqrt(-c^2
*d*x^2 + d)*(b*arcsin(c*x) + a))/(d*x), (b*c*sqrt(-d)*x*arctan(sqrt(-c^2*d*
x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2
 + d)) - sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(d*x)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\operatorname{asin}(cx)}{x^2\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\sqrt{-c^2dx^2 + d}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*x^2), x)
```

3.117 $\int \frac{a+b\sin^{-1}(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=229

$$\frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{d-c^2dx^2}}-\frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}-\frac{c^2\sqrt{}}{}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*x*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x]))/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*
ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + ((I/2)*b*c^2*Sqrt[1 - c^2
*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((I/2)*b*c^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rubi [A] time = 0.299153, antiderivative size = 229, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4701, 4713, 4709, 4183, 2279, 2391, 30}

$$\frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2\sqrt{d-c^2dx^2}}-\frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}-\frac{c^2\sqrt{}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*x*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x]))/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*
ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + ((I/2)*b*c^2*Sqrt[1 - c^2
*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((I/2)*b*c^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
```

```
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx &= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}+\frac{1}{2}c^2\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^2}\,dx}{2\sqrt{d-c^2dx^2}}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{2\sqrt{d-c^2dx^2}}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\csc(x)\,dx,x,\text{s}\right.}{2\sqrt{d-c^2dx^2}}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right.}{\sqrt{d-c^2dx^2}}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right.}{\sqrt{d-c^2dx^2}}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right.}{\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] time = 2.29856, size = 244, normalized size = 1.07

$$\frac{bc^2d^2\left(1-c^2x^2\right)^{3/2}\left(4i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-4i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+4\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right)-4\sin^{-1}(cx)\log\left(1+e^{i\sin^{-1}(cx)}\right)-2\tan\left(\frac{1}{2}\sin^{-1}(cx)\right)-2\,\text{co}\right.}{\left(d-c^2dx^2\right)^{3/2}}$$

8

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-4*a*Sqrt[d - c^2*d*x^2])/x^2 + 4*a*c^2*Sqrt[d]*Log[x] - 4*a*c^2*Sqrt[d]*
Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*c^2*d^2*(1 - c^2*x^2)^(3/2)*(-2*C
ot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]*Log[1
- E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (4*I)*Pol
yLog[2, -E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[
c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2)^(3/2))/(
8*d)
```

Maple [B] time = 0.221, size = 461, normalized size = 2.

$$-\frac{a}{2\,d x^{2}}\sqrt{-c^{2}dx^{2}+d}-\frac{ac^{2}}{2}\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^{2}dx^{2}+d}\right)\right)\frac{1}{\sqrt{d}}-\frac{b\arcsin(cx)\,c^{2}}{2\,d\left(c^{2}x^{2}-1\right)}\sqrt{-d\left(c^{2}x^{2}-1\right)}+\frac{bc}{2\left(c^{2}x^{2}-1\right)dx}\sqrt{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(1/2)-1/2*a*c^2/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2
*d*x^2+d)^(1/2))/x)-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*
c^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)/x/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/2*b
*(-d*(c^2*x^2-1))^(1/2)/x^2/d/(c^2*x^2-1)*arcsin(c*x)+1/2*b*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x
^2+1)^(1/2))-1/2*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*
c^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*I*b*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)+1/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polyl
og(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-c^{2}dx^{2}+d}(b\arcsin(cx)+a)}{c^{2}dx^{5}-dx^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b \operatorname{asin}(cx)}{x^3 \sqrt{-d(cx-1)(cx+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\sqrt{-c^2 dx^2 + d} x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*x^3), x)
```

3.118 $\int \frac{a+b\sin^{-1}(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=147

$$-\frac{2c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}-\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}+\frac{2bc^3\sqrt{1-c^2x^2}\log(x)}{3\sqrt{d-c^2dx^2}}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(6*x^2*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x]))/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(3*d*x) + (2*b*c^3*Sqrt[1 - c^2*x^2]*Log[x])/(3*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.187793, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4701, 4681, 29, 30}

$$-\frac{2c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}-\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}+\frac{2bc^3\sqrt{1-c^2x^2}\log(x)}{3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(6*x^2*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x]))/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(3*d*x) + (2*b*c^3*Sqrt[1 - c^2*x^2]*Log[x])/(3*Sqrt[d - c^2*d*x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}+\frac{1}{3}\left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^3}\,dx}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}-\frac{2c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx}+\frac{\left(2bc^3\sqrt{1-\right.}{3\sqrt{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^3}-\frac{2c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3dx}+\frac{2bc^3\sqrt{1-}{3\sqrt{d-}$$

Mathematica [A] time = 0.203436, size = 152, normalized size = 1.03

$$\frac{\sqrt{d-c^2dx^2}\left(a\left(-4c^4x^4+2c^2x^2+2\right)+bcx\sqrt{1-c^2x^2}\left(6c^2x^2+1\right)+2b\left(-2c^4x^4+c^2x^2+1\right)\sin^{-1}(cx)\right)}{6dx^3\left(c^2x^2-1\right)}+\frac{2bc^3\log(x)\sqrt{d-}{3d\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(1 + 6*c^2*x^2) + a*(2 + 2*c^
2*x^2 - 4*c^4*x^4) + 2*b*(1 + c^2*x^2 - 2*c^4*x^4)*ArcSin[c*x]))/(6*d*x^3*(
-1 + c^2*x^2)) + (2*b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*d*Sqrt[1 - c^2*x^2
])
```

Maple [C] time = 0.237, size = 849, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(1/2)-2/3*a*c^2/d/x*(-c^2*d*x^2+d)^(1/2)-2/3*I*
b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)*c^3-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c
^2*x^2+1)*c^6+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^
4-1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*(-c^2*x^2+1)*c
^4-2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)*c^6
-2*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^2*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)*c^5+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^
2*x^2-1)*arcsin(c*x)*c^3-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^
2-1)/d*x^5*c^8+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arc
sin(c*x)*c^4+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c
^6+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*c^3*(-c^2*x^2+1)^
(1/2)+4/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)*
c^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^2*(-c^2*x^2+1)
^(1/2)*c+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(
c*x)-2/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*ln((I*c*
x+(-c^2*x^2+1)^(1/2))^2-1)*c^3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.25134, size = 895, normalized size = 6.09

$$\left[\frac{2\left(bc^5x^5 - bc^3x^3\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right) - \sqrt{-c^2dx^2+d}\left(bcx^3 - bcx\right)\sqrt{-c^2x^2+1} - 2\left(2\,ac\right.}{6\left(c^2dx^5 - dx^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/6*(2*(b*c^5*x^5 - b*c^3*x^3)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4
- sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 -
 x^2)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*x^2 + 1) - 2*(2*a
*c^4*x^4 - a*c^2*x^2 + (2*b*c^4*x^4 - b*c^2*x^2 - b)*arcsin(c*x) - a)*sqrt(
-c^2*d*x^2 + d))/(c^2*d*x^5 - d*x^3), 1/6*(4*(b*c^5*x^5 - b*c^3*x^3)*sqrt(-
d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d
*x^4 - (c^2 + 1)*d*x^2 + d)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(
-c^2*x^2 + 1) - 2*(2*a*c^4*x^4 - a*c^2*x^2 + (2*b*c^4*x^4 - b*c^2*x^2 - b)*
arcsin(c*x) - a)*sqrt(-c^2*d*x^2 + d))/(c^2*d*x^5 - d*x^3)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\,\mathrm{asin}\,(cx)}{x^4\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin\,(cx) + a}{\sqrt{-c^2dx^2 + dx^4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*x^4), x)
```

3.119 $\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=221

$$-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c^6d^3}+\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^6d^2}+\frac{a+b\sin^{-1}(cx)}{c^6d\sqrt{d-c^2dx^2}}-\frac{bx^3\sqrt{d-c^2dx^2}}{9c^3d^2\sqrt{1-c^2x^2}}-\frac{5bx\sqrt{d-c^2dx^2}}{3c^5d^2\sqrt{1-c^2x^2}}$$

```
[Out] (-5*b*x*Sqrt[d - c^2*d*x^2])/(3*c^5*d^2*Sqrt[1 - c^2*x^2]) - (b*x^3*Sqrt[d
 - c^2*d*x^2])/(9*c^3*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(c^6*d*Sq
rt[d - c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(c^6*d^2)
 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^6*d^3) - (b*Sqrt[d - c^2
*d*x^2]*ArcTanh[c*x])/(c^6*d^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.291375, antiderivative size = 229, normalized size of antiderivative = 1.04, number of steps used = 8, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4703, 4707, 4677, 8, 30, 302, 206}

$$\frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2}+\frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^6d^2}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}-\frac{bx^3\sqrt{1-c^2x^2}}{9c^3d\sqrt{d-c^2dx^2}}-\frac{5bx\sqrt{1-}}{3c^5d\sqrt{d-}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-5*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d*Sqrt[d - c^2*d*x^2]) - (b*x^3*Sqrt[1 -
c^2*x^2])/(9*c^3*d*Sqrt[d - c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x]))/(c^2*d*
Sqrt[d - c^2*d*x^2]) + (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^6*d
^2) + (4*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^4*d^2) - (b*Sqrt
[1 - c^2*x^2]*ArcTanh[c*x])/(c^6*d*Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
```

```
1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{4\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^4}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2} - \frac{8\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{3c^4d} - \frac{\left(4b\sqrt{1-\right.}{3c^3d}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{c^5d\sqrt{d-c^2dx^2}} - \frac{bx^3\sqrt{1-c^2x^2}}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^6d^2}$$

$$= -\frac{5bx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} - \frac{bx^3\sqrt{1-c^2x^2}}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.}{3c^6d^2}$$

Mathematica [C] time = 0.289312, size = 166, normalized size = 0.75

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(3a\left(c^4x^4+4c^2x^2-8\right)+bcx\sqrt{1-c^2x^2}\left(c^2x^2+15\right)+3b\left(c^4x^4+4c^2x^2-8\right)\sin^{-1}(cx)\right)-9ibc\sqrt{1-c^2}\right.}{9c^6\sqrt{-c^2}d^2\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(15 + c^2*x^2) +
3*a*(-8 + 4*c^2*x^2 + c^4*x^4) + 3*b*(-8 + 4*c^2*x^2 + c^4*x^4)*ArcSin[c*x]
) - (9*I)*b*c*Sqrt[1 - c^2*x^2]*EllipticF[I*ArcSinh[Sqrt[-c^2]*x], 1]))/(9*
c^6*Sqrt[-c^2]*d^2*(-1 + c^2*x^2))
```

Maple [C] time = 0.334, size = 423, normalized size = 1.9

$$-\frac{ax^4}{3c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}-\frac{4ax^2}{3dc^4}\frac{1}{\sqrt{-c^2dx^2+d}}+\frac{8a}{3dc^6}\frac{1}{\sqrt{-c^2dx^2+d}}+\frac{bx^3}{9c^3d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}+\frac{5}{3c^5d^2(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -1/3*a*x^4/c^2/d/(-c^2*d*x^2+d)^(1/2)-4/3*a/c^4*x^2/d/(-c^2*d*x^2+d)^(1/2)+
8/3*a/c^6/d/(-c^2*d*x^2+d)^(1/2)+1/9*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)*x^3+5/3*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)*x-8/3*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*a
rcsin(c*x)+1/3*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^4
+4/3*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2-b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^6/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1
)^(1/2)-I)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^6/d^2/(c^2*x^2-1)*
ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.22877, size = 942, normalized size = 4.26

$$\left[\frac{9\left(bc^2x^2-b\right)\sqrt{d}\log\left(-\frac{c^6dx^6+5c^4dx^4-5c^2dx^2+4\left(c^3x^3+cx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3c^4x^4+3c^2x^2-1}\right)+4\left(bc^3x^3+15bcx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+}{36\left(c^8d^2x^2-c^6d^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/36*(9*(b*c^2*x^2 - b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^
2 + 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/
(c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) + 4*(b*c^3*x^3 + 15*b*c*x)*sqrt(-c^2
*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 12*(a*c^4*x^4 + 4*a*c^2*x^2 + (b*c^4*x^4 +
 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^2*x^2 -
 c^6*d^2), -1/18*(9*(b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*
sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) - 2*(b*c^3*x^3 + 15*b*c*x)
*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(a*c^4*x^4 + 4*a*c^2*x^2 + (b*
c^4*x^4 + 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*
d^2*x^2 - c^6*d^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5 (a + b \operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^5}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^5/(-c^2*d*x^2 + d)^(3/2), x)
```

3.120 $\int \frac{x^4(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=214

$$\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}-\frac{3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc^5d\sqrt{d-c^2dx^2}}-\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\mathrm{l}}{2c^5d\sqrt{d}}$$

```
[Out] -(b*x^2*Sqrt[1 - c^2*x^2])/(4*c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcS
in[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*Arc
Sin[c*x]))/(2*c^4*d^2) - (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c
^5*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(2*c^5*d
*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.2872, antiderivative size = 214, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4703, 4707, 4643, 4641, 30, 266, 43}

$$\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}-\frac{3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc^5d\sqrt{d-c^2dx^2}}-\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\mathrm{l}}{2c^5d\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -(b*x^2*Sqrt[1 - c^2*x^2])/(4*c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcS
in[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*Arc
Sin[c*x]))/(2*c^4*d^2) - (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c
^5*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(2*c^5*d
*Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
```

```
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{3\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^3}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} - \frac{3\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{2c^4d} - \frac{\left(3b\sqrt{1-c^2 \ldots}\right.}{2c^3d\sqrt{d \ldots}}$$

$$= -\frac{3bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} - \frac{\left(3\sqrt{1-c^2x \ldots}\right.}{2c^4d \ldots}$$

$$= -\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^4d^2} - \frac{3\sqrt{1-c^2x^2 \ldots}}{4bc^5 \ldots}$$

Mathematica [A] time = 0.468047, size = 173, normalized size = 0.81

$$\frac{-4ac\sqrt{d}x\left(c^2x^2-3\right)+12a\sqrt{d-c^2dx^2}\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(c^2x^2-1\right)}\right)+b\sqrt{d}\left(\sqrt{1-c^2x^2}\left(4\log\left(1-c^2x^2\right)-6\sin^{-1}(cx)^2+2\sin\left(2 \ldots\right.\right.\right.}{8c^5d^{3/2}\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a*c*Sqrt[d]*x*(-3 + c^2*x^2) + 12*a*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqr
t[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b*Sqrt[d]*(8*c*x*ArcSin[c*x]
+ Sqrt[1 - c^2*x^2]*(-6*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 4*Log[1 - c^2*
```

```
x^2] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])))/(8*c^5*d^(3/2)*Sqrt[d - c^2*d*x^
2])
```

Maple [C] time = 0.301, size = 436, normalized size = 2.

$$-\frac{ax^3}{2c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}+\frac{3ax}{2dc^4}\frac{1}{\sqrt{-c^2dx^2+d}}-\frac{3a}{2dc^4}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}+\frac{3b(\arcsin(cx))^2}{4d^2c^5(c^2x^2-1)}\sqrt{-d(c^2x^2-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -1/2*a*x^3/c^2/d/(-c^2*d*x^2+d)^(1/2)+3/2*a/c^4*x/d/(-c^2*d*x^2+d)^(1/2)-3/
2*a/c^4/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+3/4*b*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)^2
+1/2*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^3+1/4*b*(-d
*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+I*b*(-c^2*x^
2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)-3/2*b*(-d
*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*x-1/8*b*(-d*(c^2*x^2-1)
)^(1/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-b*(-d*(c^2*x^2-1))^(1/2)*(-c
^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^4\arcsin(cx)+ax^4)\sqrt{-c^2dx^2+d}}{c^4d^2x^4-2c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*
c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^4(a+b\,\text{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^4}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(-c^2*d*x^2 + d)^(3/2), x)
```

3.121 $\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=142

$$\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^4d^2}+\frac{a+b\sin^{-1}(cx)}{c^4d\sqrt{d-c^2dx^2}}-\frac{bx\sqrt{d-c^2dx^2}}{c^3d^2\sqrt{1-c^2x^2}}-\frac{b\sqrt{d-c^2dx^2}\tanh^{-1}(cx)}{c^4d^2\sqrt{1-c^2x^2}}$$

```
[Out] -((b*x*Sqrt[d - c^2*d*x^2])/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*
x])/(c^4*d*Sqrt[d - c^2*d*x^2]) + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(c^4*d^2) - (b*Sqrt[d - c^2*d*x^2]*ArcTanh[c*x])/(c^4*d^2*Sqrt[1 - c^2*x^2
])
```

Rubi [A] time = 0.180346, antiderivative size = 146, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4703, 4677, 8, 321, 206}

$$\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^4d^2}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}-\frac{bx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^4d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((b*x*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2])) + (x^2*(a + b*ArcSin
[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(c^4*d^2) - (b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(c^4*d*Sqrt[d - c^2*d
*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}dx = \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{2\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^2}{1-c^2x^2}dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^4d^2} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int}{c^3d\sqrt{d-c}}$$

$$= -\frac{bx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^4d^2} - \frac{b\sqrt{1-c^2x^2}\,\mathrm{ta}}{c^4d\sqrt{d-c}}$$

Mathematica [C] time = 0.2074, size = 136, normalized size = 0.96

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(ac^2x^2-2a+bcx\sqrt{1-c^2x^2}+b\left(c^2x^2-2\right)\sin^{-1}(cx)\right)-ibc\sqrt{1-c^2x^2}\,\mathrm{EllipticF}\left(i\sinh^{-1}\left(\sqrt{-c^2}x\right),1\right.}{c^4\sqrt{-c^2}d^2\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(-2*a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2
] + b*(-2 + c^2*x^2)*ArcSin[c*x]) - I*b*c*Sqrt[1 - c^2*x^2]*EllipticF[I*Arc
Sinh[Sqrt[-c^2]*x], 1]))/(c^4*Sqrt[-c^2]*d^2*(-1 + c^2*x^2))
```

Maple [C] time = 0.214, size = 306, normalized size = 2.2

$$-\frac{ax^2}{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}+2\frac{a}{dc^4\sqrt{-c^2dx^2+d}}+\frac{bx}{c^3d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}+\frac{b\arcsin(cx)\,x^2}{c^2d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -a*x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2*a/d/c^4/(-c^2*d*x^2+d)^(1/2)+b*(-d*(c^2
*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+b*(-d*(c^2*x^2-1))^
(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2-2*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^
2/(c^2*x^2-1)*arcsin(c*x)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^4/d
^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^
```

```
2*x^2+1)^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.11859, size = 810, normalized size = 5.7

$$\left[\frac{4\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx+\left(bc^2x^2-b\right)\sqrt{d}\log\left(-\frac{c^6dx^6+5c^4dx^4-5c^2dx^2+4\left(c^3x^3+cx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3c^4x^4+3c^2x^2-1}\right)+4\left(ac^2x^2+\left(b\right.\right.}{4\left(c^6d^2x^2-c^4d^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x + (b*c^2*x^2 - b)*sqr
t(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 + 4*(c^3*x^3 + c*x)*sqrt(-
c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 - 3*c^4*x^4 + 3*c^2
*x^2 - 1)) + 4*(a*c^2*x^2 + (b*c^2*x^2 - 2*b)*arcsin(c*x) - 2*a)*sqrt(-c^2*
d*x^2 + d))/(c^6*d^2*x^2 - c^4*d^2), 1/2*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*
x^2 + 1)*b*c*x - (b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqr
t(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) + 2*(a*c^2*x^2 + (b*c^2*x^2 -
 2*b)*arcsin(c*x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^6*d^2*x^2 - c^4*d^2)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)x^3}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)*x^3/(-c^2*d*x^2 + d)^(3/2), x)
```

3.122 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=135

$$-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc^3d\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^3d\sqrt{d-c^2dx^2}}$$

```
[Out] (x*(a + b*ArcSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(2*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]
*Log[1 - c^2*x^2])/(2*c^3*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.159255, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4703, 4643, 4641, 260}

$$-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc^3d\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^3d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(2*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]
*Log[1 - c^2*x^2])/(2*c^3*d*Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$
$$= \frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$
$$= \frac{x\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^3d\sqrt{d-c^2dx^2}}$$

Mathematica [A] time = 0.196347, size = 160, normalized size = 1.19

$$-\frac{ax\sqrt{-d\left(c^2x^2-1\right)}}{c^2d^2\left(c^2x^2-1\right)} + \frac{a\tan^{-1}\left(\frac{cx\sqrt{-d(c^2x^2-1)}}{\sqrt{d}(c^2x^2-1)}\right)}{c^3d^{3/2}} + \frac{b\left(2cx\sin^{-1}(cx) - \sqrt{1-c^2x^2}\left(\sin^{-1}(cx)^2 - 2\log\left(\sqrt{1-c^2x^2}\right)\right)\right)}{2c^3d\sqrt{d\left(1-c^2x^2\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((a*x*Sqrt[-(d*(-1 + c^2*x^2))])/(c^2*d^2*(-1 + c^2*x^2))) + (a*ArcTan[(c*
x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^3*d^(3/2)) + (b*
(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2 - 2*Log[Sqrt[1 - c^2*
x^2]])))/(2*c^3*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [C] time = 0.164, size = 274, normalized size = 2.

$$\frac{ax}{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}} - \frac{a}{c^2d}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}} + \frac{b\left(\arcsin(cx)\right)^2}{2d^2c^3\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1} + \frac{ib\,\text{arcsi}}{d^2c^3\left(c^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a*x/c^2/d/(-c^2*d*x^2+d)^(1/2)-a/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))+1/2*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/
c^3/(c^2*x^2-1)*arcsin(c*x)^2+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/c
^2/(c^2*x^2-1)*x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x
^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(bx^2\arcsin\left(cx\right)+ax^2\right)}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^4*d^2*x^4 - 2*
c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\,\mathrm{asin}\left(cx\right)\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)x^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(-c^2*d*x^2 + d)^(3/2), x)
```

3.123 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=73

$$\frac{a+b\sin^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[Out] (a + b*ArcSin[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1 - c^2*x^2]*ArcT
anh[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.0702272, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.08, Rules used = {4677, 206}

$$\frac{a+b\sin^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1 - c^2*x^2]*ArcT
anh[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx &= \frac{a+b\sin^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}\\ &= \frac{a+b\sin^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] time = 0.0271635, size = 51, normalized size = 0.7

$$\frac{a-b\sqrt{1-c^2x^2}\tanh^{-1}(cx)+b\sin^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x] - b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(c^2*d*Sqrt[d - c^2*
d*x^2])
```

Maple [C] time = 0.095, size = 194, normalized size = 2.7

$$\frac{a}{c^2 d}\frac{1}{\sqrt{-c^2dx^2+d}}-\frac{b\arcsin(cx)}{c^2d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}+\frac{b}{c^2d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}\ln\left(icx+\sqrt{-c^2x^2+1}+i\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a/c^2/d/(-c^2*d*x^2+d)^(1/2)-b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*a
rcsin(c*x)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(c^2*x^2-1)*
ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
c^2/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{\frac{1}{2}\left(\sqrt{cx+1}\sqrt{-cx+1}c^3d^2\left(\frac{2x}{c^2d^2}-\frac{\log(cx+1)}{c^3d^2}+\frac{\log(cx-1)}{c^3d^2}\right)+2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right)b}{\sqrt{cx+1}\sqrt{-cx+1}c^2d^{\frac{3}{2}}}+\frac{a}{\sqrt{-c^2dx^2+d}c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] (sqrt(c*x + 1)*sqrt(-c*x + 1)*c^3*d^2*integrate(x^2/(c^4*d^2*x^4 - c^2*d^2*
x^2 + (c^2*d^2*x^2 - d^2)*e^(log(c*x + 1) + log(-c*x + 1))), x) + arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(sqrt(c*x + 1)*sqrt(-c*x + 1)*c^2*d^(3
/2)) + a/(sqrt(-c^2*d*x^2 + d)*c^2*d)
```

Fricas [A] time = 2.11477, size = 595, normalized size = 8.15

$$\left[\frac{\left(bc^2x^2-b\right)\sqrt{d}\log\left(-\frac{c^6dx^6+5c^4dx^4-5c^2dx^2+4\left(c^3x^3+cx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3c^4x^4+3c^2x^2-1}\right)-4\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{4\left(c^4d^2x^2-c^2d^2\right)},-\frac{\left(bc^2x^2-b\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*((b*c^2*x^2 - b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 +
 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^
6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 4*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x)
 + a))/(c^4*d^2*x^2 - c^2*d^2), -1/2*((b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqr
```

```
t(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) + 2*sqrt
(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c^4*d^2*x^2 - c^2*d^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\operatorname{asin}\left(cx\right)\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin\left(cx\right)+a)x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(-c^2*d*x^2 + d)^(3/2), x)
```

3.124 $\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=80

$$\frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2cd\sqrt{d-c^2dx^2}}$$

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[
1 - c^2*x^2])/(2*c*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.0363379, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4653, 260}

$$\frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2cd\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[
1 - c^2*x^2])/(2*c*d*Sqrt[d - c^2*d*x^2])
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx&=\frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}\\&=\frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2cd\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] time = 0.202672, size = 77, normalized size = 0.96

$$-\frac{\sqrt{d-c^2dx^2}\left(2acx+b\sqrt{1-c^2x^2}\log\left(c^2x^2-1\right)+2bcx\sin^{-1}(cx)\right)}{2cd^2\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -(Sqrt[d - c^2*d*x^2]*(2*a*c*x + 2*b*c*x*ArcSin[c*x] + b*Sqrt[1 - c^2*x^2]*
Log[-1 + c^2*x^2]))/(2*c*d^2*(-1 + c^2*x^2))
```

Maple [C] time = 0.086, size = 177, normalized size = 2.2

$$\frac{ax}{d}\frac{1}{\sqrt{-c^2dx^2+d}}+\frac{ib\arcsin(cx)}{cd^2(c^2x^2-1)}\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}-\frac{b\arcsin(cx)x}{d^2(c^2x^2-1)}\sqrt{-d(c^2x^2-1)}-\frac{b}{cd^2(c^2x^2-1)}\sqrt{-d(c^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a/d*x/(-c^2*d*x^2+d)^(1/2)+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/
d^2/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/(c^2*x
^2-1)*x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^2/(c^2*x^2-1)*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [A] time = 1.7018, size = 93, normalized size = 1.16

$$-\frac{bc\sqrt{\frac{1}{c^4d}}\log\left(x^2-\frac{1}{c^2}\right)}{2\,d}+\frac{bx\arcsin(cx)}{\sqrt{-c^2dx^2+d}d}+\frac{ax}{\sqrt{-c^2dx^2+d}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*b*c*sqrt(1/(c^4*d))*log(x^2 - 1/c^2)/d + b*x*arcsin(c*x)/(sqrt(-c^2*d*
x^2 + d)*d) + a*x/(sqrt(-c^2*d*x^2 + d)*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^4 - 2*c^2*d^2*
x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\,\mathrm{asin}\,(cx)}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(-c^2*d*x^2 + d)^(3/2), x)
```

3.125 $\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=220

$$\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i}\right.}{d\sqrt{d}}$$

```
[Out] (a + b*ArcSin[c*x])/(d*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1
 - c^2*x^2]*ArcTanh[c*x])/(d*Sqrt[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*
PolyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2
*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.311222, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4705, 4713, 4709, 4183, 2279, 2391, 206}

$$\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i}\right.}{d\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])/(d*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1
 - c^2*x^2]*ArcTanh[c*x])/(d*Sqrt[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*
PolyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2
*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
```

```
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx &= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{d}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int (a+bx)\csc(x)\,dx,x,\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}\\
&= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\ldots\\
&= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\ldots\\
&= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\ldots
\end{aligned}
$$

Mathematica [A] time = 0.997716, size = 300, normalized size = 1.36

$$
\frac{bd\left(i\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right)-\sqrt{1-c^2x^2}\sin^{-1}(cx)\log\left(1+e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\ldots}{\sqrt{d-c^2dx^2}\ldots}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-((a*Sqrt[d - c^2*d*x^2])/(-1 + c^2*x^2)) + a*Sqrt[d]*Log[x] - a*Sqrt[d]*L
og[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d*(ArcSin[c*x] + Sqrt[1 - c^2*x^2]
*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log
[1 + E^(I*ArcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]] + I*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*Sqrt[1 - c^2*x
^2]*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2])/d^2
```

Maple [A] time = 0.132, size = 344, normalized size = 1.6

$$\frac{a}{d}\frac{1}{\sqrt{-c^2dx^2+d}}-a\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)d^{-\frac{3}{2}}-\frac{b\arcsin(cx)}{d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}-\frac{2\,ib}{d^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}\sqrt{-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a/d/(-c^2*d*x^2+d)^(1/2)-a/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/
x)-b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)-2*I*b*(-c^2*x^2+1)^
(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arctan(I*c*x+(-c^2*x^2+1)^(1/2
))-I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(I*c*
x+(-c^2*x^2+1)^(1/2))-I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^
2*x^2-1)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^4d^2x^5-2\,c^2d^2x^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^5 - 2*c^2*d^2*
x^3 + d^2*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\,\mathrm{asin}\,(cx)}{x\,(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin\,(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x), x)
```

3.126 $\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=150

$$\frac{2c^2x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{d^2\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

```
[Out] -((a + b*ArcSin[c*x])/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin[c
*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[x])/(d^2*Sqrt[
1 - c^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[1 - c^2*x^2])/(2*d^2*Sqrt[1 -
c^2*x^2])
```

Rubi [A] time = 0.155475, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4701, 4653, 260, 266, 36, 29, 31}

$$\frac{2c^2x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log(x)}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin[c
*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*c*Sqrt[1 - c^2*x^2]*Log[x])/(d*Sqrt[d -
c^2*d*x^2]) + (b*c*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(2*d*Sqrt[d - c^2*d*
x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x(1-c^2x^2)}\,dx}{d\sqrt{d-c^2dx^2}}\\ &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{1}{x(1-c^2x)}\,dx,x,x^2\right)}{2d\sqrt{d-c^2dx^2}}-\frac{\left(2bc^3\right.}{}\\ &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{d\sqrt{d-c^2dx^2}}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\text{Subst}}{2d\sqrt{d-c^2}}\\ &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log(x)}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2d\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] time = 0.227789, size = 117, normalized size = 0.78

$$-\frac{\sqrt{d-c^2dx^2}\left(4ac^2x^2-2a+bcx\sqrt{1-c^2x^2}\log\left(x^2\right)+bcx\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)+2b\left(2c^2x^2-1\right)\sin^{-1}(cx)\right)}{2d^2x\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -(Sqrt[d - c^2*d*x^2]*(-2*a + 4*a*c^2*x^2 + 2*b*(-1 + 2*c^2*x^2)*ArcSin[c*x
] + b*c*x*Sqrt[1 - c^2*x^2]*Log[x^2] + b*c*x*Sqrt[1 - c^2*x^2]*Log[1 - c^2*
x^2]))/(2*d^2*x*(-1 + c^2*x^2))
```

Maple [C] time = 0.147, size = 239, normalized size = 1.6

$$-\frac{a}{dx}\frac{1}{\sqrt{-c^2dx^2+d}}+2\frac{ac^2x}{d\sqrt{-c^2dx^2+d}}+\frac{2\,ib\arcsin(cx)\,c}{d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}-2\frac{b\sqrt{-d\left(c^2x^2-1\right)}\arcsin(cx)\,xc^2}{d^2\left(c^2x^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -a/d/x/(-c^2*d*x^2+d)^(1/2)+2*a*c^2/d*x/(-c^2*d*x^2+d)^(1/2)+2*I*b*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*c-2*b*(-d*(c^
2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)/d^2*x*c^2+b*(-d*(c^2*x^2-1))^(1/2)*
arcsin(c*x)/(c^2*x^2-1)/d^2/x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d
^2/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^4-1)*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^4d^2x^6-2\,c^2d^2x^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^6 - 2*c^2*d^2*
x^4 + d^2*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\operatorname{asin}(cx)}{x^2\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\arcsin(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^2), x)
```

3.127 $\int \frac{a+b\sin^{-1}(cx)}{x^3(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=316

$$\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2d\sqrt{d-c^2dx^2}}-\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2d\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin}{2dx^2\sqrt{d-}}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d*x*Sqrt[d - c^2*d*x^2]) + (3*c^2*(a + b*ArcSin
[c*x]))/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])/(2*d*x^2*Sqrt[d - c
^2*d*x^2]) - (3*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcS
in[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])
/(d*Sqrt[d - c^2*d*x^2]) + (((3*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E
^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (((3*I)/2)*b*c^2*Sqrt[1 - c^2*
x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.441389, antiderivative size = 316, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4701, 4705, 4713, 4709, 4183, 2279, 2391, 206, 325}

$$\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2d\sqrt{d-c^2dx^2}}-\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2d\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin}{2dx^2\sqrt{d-}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```


```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d*x*Sqrt[d - c^2*d*x^2]) + (3*c^2*(a + b*ArcSin
[c*x]))/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])/(2*d*x^2*Sqrt[d - c
^2*d*x^2]) - (3*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcS
in[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])
/(d*Sqrt[d - c^2*d*x^2]) + (((3*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E
^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (((3*I)/2)*b*c^2*Sqrt[1 - c^2*
x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
```

```
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}}+\frac{1}{2}\left(3c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^2(1-c^2x^2)}\,dx}{2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}}+\frac{\left(3c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{2d}+\frac{(bc^3 \cdots}{\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{bc^2\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{bc^2\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{3c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx \cdots\right.}{d\sqrt{d-c^2d \cdots}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{3c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx \cdots\right.}{d\sqrt{d-c^2d \cdots}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{3c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx \cdots\right.}{d\sqrt{d-c^2d \cdots}}$$

Mathematica [A] time = 2.11962, size = 404, normalized size = 1.28

$$\frac{b\sqrt{d}\left(6icx\sin\left(2\sin^{-1}(cx)\right)\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-6icx\sin\left(2\sin^{-1}(cx)\right)\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\left(2\left(\log\left(\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)-\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)\right)-\log \cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] ((4*a*Sqrt[d]*(-1 + 3*c^2*x^2))/(x^2*Sqrt[d - c^2*d*x^2]) + 12*a*c^2*Log[x]
 - 12*a*c^2*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*Sqrt[d]*(2*ArcSin[c*x
] - 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log
[1 - E^(I*ArcSin[c*x])] + 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*Arc
Sin[c*x])] - 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]] + Sqrt[1 - c^2*x^2]*(3*ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1
+ E^(I*ArcSin[c*x])]) + 2*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])) + 2*Cos[3*ArcSin[c*x]]*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sin[2*ArcSin[c*x]] + (6*I)*c*x*P
olyLog[2, -E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - (6*I)*c*x*PolyLog[2, E^(
I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]]))/(x^2*Sqrt[d - c^2*d*x^2]))/(8*d^(3/2))
```

Maple [A] time = 0.23, size = 474, normalized size = 1.5

$$-\frac{a}{2\,dx^2}\frac{1}{\sqrt{-c^2dx^2+d}}+\frac{3\,ac^2}{2\,d}\frac{1}{\sqrt{-c^2dx^2+d}}-\frac{3\,ac^2}{2}\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)d^{-\frac{3}{2}}-\frac{3\,b\arcsin(cx)\,c^2}{2\,d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2 \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -1/2*a/d/x^2/(-c^2*d*x^2+d)^(1/2)+3/2*a*c^2/d/(-c^2*d*x^2+d)^(1/2)-3/2*a*c^
2/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-3/2*b*(-d*(c^2*x^2-1))
^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*c^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^
2*x^2-1)/x*(-c^2*x^2+1)^(1/2)*c+1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1
)/x^2*arcsin(c*x)+3/2*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-
1)/d^2*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arctan(I*c*x+(-c^2*x^2+1)^(1
/2))-3/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*
dilog(I*c*x+(-c^2*x^2+1)^(1/2))-3/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))
^(1/2)/(c^2*x^2-1)/d^2*c^2*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^4d^2x^7-2\,c^2d^2x^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^7 - 2*c^2*d^2*
x^5 + d^2*x^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\arcsin(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^3), x)
```

3.128 $\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=238

$$\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\sqrt{d-c^2dx^2}}-\frac{4c^2\left(a+b\sin^{-1}(cx)\right)}{3dx\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^2x^2\sqrt{1-c^2x^2}}+\frac{5bc^3\log(x)\sqrt{d-c^2dx^2}}{3d^2\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-}}{2}$$

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(6*d^2*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*
x])/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x]))/(3*d*x*Sqrt
[d - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*Sqrt[d - c^2*d*x^2])
+ (5*b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*d^2*Sqrt[1 - c^2*x^2]) + (b*c^3*S
qrt[d - c^2*d*x^2]*Log[1 - c^2*x^2])/(2*d^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.292013, antiderivative size = 238, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4701, 4653, 260, 266, 36, 29, 31, 44}

$$\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\sqrt{d-c^2dx^2}}-\frac{4c^2\left(a+b\sin^{-1}(cx)\right)}{3dx\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}}{6dx^2\sqrt{d-c^2dx^2}}+\frac{5bc^3\sqrt{1-c^2x^2}\log(x)}{3d\sqrt{d-c^2dx^2}}+\frac{bc^3\sqrt{1-c}}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(6*d*x^2*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x]
)/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x]))/(3*d*x*Sqrt[d
 - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*Sqrt[d - c^2*d*x^2]) +
(5*b*c^3*Sqrt[1 - c^2*x^2]*Log[x])/(3*d*Sqrt[d - c^2*d*x^2]) + (b*c^3*Sqrt[
1 - c^2*x^2]*Log[1 - c^2*x^2])/(2*d*Sqrt[d - c^2*d*x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}+\frac{1}{3}\left(4c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^3(1-c^2x^2)}\,dx}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2\left(a+b\sin^{-1}(cx)\right)}{3dx\sqrt{d-c^2dx^2}}+\frac{1}{3}\left(8c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\mathrm{S}}{6}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2\left(a+b\sin^{-1}(cx)\right)}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\sqrt{d-c^2dx^2}}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\right.}{6d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2\left(a+b\sin^{-1}(cx)\right)}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\sqrt{d-c^2dx^2}}+\frac{bc^3}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2\left(a+b\sin^{-1}(cx)\right)}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\sqrt{d-c^2dx^2}}+\frac{5bc}{}$$

Mathematica [A] time = 0.311926, size = 162, normalized size = 0.68

$$\frac{\sqrt{d-c^2dx^2}\left(-16ac^4x^4+8ac^2x^2+2a+bcx\sqrt{1-c^2x^2}-5bc^3x^3\sqrt{1-c^2x^2}\log\left(x^2\right)-3bc^3x^3\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)+2\right.}{6d^2x^3\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(2*a + 8*a*c^2*x^2 - 16*a*c^4*x^4 + b*c*x*Sqrt[1 - c^2
*x^2] + 2*b*(1 + 4*c^2*x^2 - 8*c^4*x^4)*ArcSin[c*x] - 5*b*c^3*x^3*Sqrt[1 -
c^2*x^2]*Log[x^2] - 3*b*c^3*x^3*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]))/(6*d^2
*x^3*(-1 + c^2*x^2))
```

Maple [C] time = 0.25, size = 1045, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -1/3*a/d/x^3/(-c^2*d*x^2+d)^(1/2)-4/3*a*c^2/d/x/(-c^2*d*x^2+d)^(1/2)+8/3*a*
c^4/d*x/(-c^2*d*x^2+d)^(1/2)+4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*
x^2-1)/d^2*x^3*c^6+16/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(
c^2*x^2-1)*arcsin(c*x)*c^3-16*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x
^2-1)/d^2*x^5*c^8+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d
^2*x^7*c^10+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5
*(-c^2*x^2+1)*c^8-4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^
2*x*(-c^2*x^2+1)*c^4-64/3*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/
d^2*x^3*arcsin(c*x)*c^6-16/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^
2-1)/d^2*x^3*(-c^2*x^2+1)*c^6+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c
^2*x^2-1)/d^2*x*c^4-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)
/d^2*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+8*b*(-d*(c^2*x^2-1))^(1/2)/(8*c
^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*c^4-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8
*c^4*x^4-7*c^2*x^2-1)/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+4/3*b*(-d*(c^2
*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*c^3*(-c^2*x^2+1)^(1/2)+4*b*(-d*(
c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)*c^2+1/6*b*(-d*(
c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^2*(-c^2*x^2+1)^(1/2)*c+1/3*
b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^3*arcsin(c*x)-b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2
+1)^(1/2))^2)*c^3-5/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*
x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^4d^2x^8-2\,c^2d^2x^6+d^2x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^8 - 2*c^2*d^2*
x^6 + d^2*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^4), x)
```

3.129 $\int \frac{x^6\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=293

$$-\frac{5x^3\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{5x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^6d^3}+\frac{5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc^7d^2\sqrt{d-c^2dx^2}}+\frac{x^5\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}+\frac{bx^2}{4c^5d^2}$$

```
[Out] -b/(6*c^7*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^2*
x^2])/(4*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (x^5*(a + b*ArcSin[c*x]))/(3*c^2*d*
(d - c^2*d*x^2)^(3/2)) - (5*x^3*(a + b*ArcSin[c*x]))/(3*c^4*d^2*Sqrt[d - c^
2*d*x^2]) - (5*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*c^6*d^3) + (5*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c^7*d^2*Sqrt[d - c^2*d*x^2])
- (7*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(6*c^7*d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.442504, antiderivative size = 293, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4703, 4707, 4643, 4641, 30, 266, 43}

$$-\frac{5x^3\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{5x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2c^6d^3}+\frac{5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc^7d^2\sqrt{d-c^2dx^2}}+\frac{x^5\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}+\frac{bx^2}{4c^5d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^6*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -b/(6*c^7*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^2*
x^2])/(4*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (x^5*(a + b*ArcSin[c*x]))/(3*c^2*d*
(d - c^2*d*x^2)^(3/2)) - (5*x^3*(a + b*ArcSin[c*x]))/(3*c^4*d^2*Sqrt[d - c^
2*d*x^2]) - (5*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*c^6*d^3) + (5*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c^7*d^2*Sqrt[d - c^2*d*x^2])
- (7*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(6*c^7*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] && !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^6\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{5\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^5}{\left(1-c^2x^2\right)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{5x^3\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{5\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{c^4d^2} + \frac{\left(5b\sqrt{1-c^2x^2}\right)\int

Antiderivative was successfully verified.

```
[In] Integrate[(x^6*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (4*b*c*Sqrt[d]*x*(15 - 20*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x] - 30*b*Sqrt[d]*(
1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 - 60*a*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2]*
ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d]*(4*a*c
*x*(15 - 20*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(7 - 9*c^2*x^2 + 6*c
^4*x^4) + 28*b*(1 - c^2*x^2)^(3/2)*Log[1 - c^2*x^2]))/(24*c^7*d^(5/2)*(-1 +
 c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.403, size = 1716, normalized size = 5.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -5/2*a/c^6/d^2*x/(-c^2*d*x^2+d)^(1/2)+5/2*a/c^6/d^2/(c^2*d)^(1/2)*arctan((c
^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*a*x^5/c^2/d/(-c^2*d*x^2+d)^(3/2)+5/
6*a/c^4*x^3/d/(-c^2*d*x^2+d)^(3/2)-406*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c
^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^3*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)*x^4+1120/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+33
4*c^4*x^4-209*c^2*x^2+49)/c^5*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+147*I*b*(-
d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49
)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^6+91/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/
(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^4*(-c^2*x^2+1)*x^3-7*
I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*
x^2+49)/c^6*(-c^2*x^2+1)*x-343/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8
-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^7*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
-14/3*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^7/d^3/(c^2*x^2-1)*arc
sin(c*x)-49/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^
4*x^4-209*c^2*x^2+49)/c^2*(-c^2*x^2+1)*x^5-49/6*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^7*(-c^2*x^2+1)^(1/2
)+1/8*b*(-d*(c^2*x^2-1))^(1/2)/c^7/d^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+147*b
*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2
+49)*arcsin(c*x)*x^7-49/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^
6*x^6+334*c^4*x^4-209*c^2*x^2+49)*x^7+37/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63
*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^5*x^2*(-c^2*x^2+1)^(1/2)
+7/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^7/d^3/(c^2*x^2-1)*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)+1009/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^
8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^4*arcsin(c*x)*x^3-98*b*(-d*(c^2
*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^6*
arcsin(c*x)*x-1/2*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcsin(c*x)*
x^3+1/2*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)*x-385*b*(-
d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49
)/c^2*arcsin(c*x)*x^5-21/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6
*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^3*(-c^2*x^2+1)^(1/2)*x^4-5/4*b*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^7/d^3/(c^2*x^2-1)*arcsin(c*x)^2-1/4*b*(-
d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2-133/6*I*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+4
9)/c^4*x^3+7*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-237*c^6*x^6+334*c^4
*x^4-209*c^2*x^2+49)/c^6*x+70/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(63*c^8*x^8-
237*c^6*x^6+334*c^4*x^4-209*c^2*x^2+49)/c^2*x^5
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(bx^6 \arcsin\left(cx\right) + ax^6\right)\sqrt{-c^2dx^2 + d}}{c^6d^3x^6 - 3\,c^4d^3x^4 + 3\,c^2d^3x^2 - d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^6*arcsin(c*x) + a*x^6)*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**6*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin\left(cx\right) + a)x^6}{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^6/(-c^2*d*x^2 + d)^(5/2), x)
```

3.130 $\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=219

$$-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^6d^3}-\frac{2\left(a+b\sin^{-1}(cx)\right)}{c^6d^2\sqrt{d-c^2dx^2}}+\frac{a+b\sin^{-1}(cx)}{3c^6d\left(d-c^2dx^2\right)^{3/2}}+\frac{bx\sqrt{d-c^2dx^2}}{c^5d^3\sqrt{1-c^2x^2}}-\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+11b\sqrt{}$$

```
[Out] -(b*x*Sqrt[d - c^2*d*x^2])/(6*c^5*d^3*(1 - c^2*x^2)^(3/2)) + (b*x*Sqrt[d -
c^2*d*x^2])/(c^5*d^3*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(3*c^6*d*(d -
 c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x]))/(c^6*d^2*Sqrt[d - c^2*d*x^2])
- (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(c^6*d^3) + (11*b*Sqrt[d - c^2*
d*x^2]*ArcTanh[c*x])/(6*c^6*d^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.316104, antiderivative size = 234, normalized size of antiderivative = 1.07, number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4703, 4677, 8, 321, 206, 288}

$$-\frac{4x^2\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^6d^3}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{bx^3}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5bx\sqrt{1-}}{6c^5d^2\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -(b*x^3)/(6*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (5*b*x*Sqrt[1
- c^2*x^2])/(6*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x]))/(3*
c^2*d*(d - c^2*d*x^2)^(3/2)) - (4*x^2*(a + b*ArcSin[c*x]))/(3*c^4*d^2*Sqrt[
d - c^2*d*x^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^6*d^3) +
 (11*b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*c^6*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rubi steps

$$\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{4\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^4}{\left(1-c^2x^2\right)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^3}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{4x^2\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{8\int \frac{x(a+b\sin\cdots}{\sqrt{d-c\cdots}}}{3c^4\cdots}$$

$$= -\frac{bx^3}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}}{6c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{4x^2\left(a+b\sin\cdots\right.}{3c^4d^2\sqrt{d-c\cdots}}$$

$$= -\frac{bx^3}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5bx\sqrt{1-c^2x^2}}{6c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{4x^2\left(a+b\sin\cdots\right.}{3c^4d^2\sqrt{d-c\cdots}}$$

Mathematica [C] time = 0.307183, size = 169, normalized size = 0.77

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(2a\left(3c^4x^4-12c^2x^2+8\right)+bcx\sqrt{1-c^2x^2}\left(6c^2x^2-5\right)+2b\left(3c^4x^4-12c^2x^2+8\right)\sin^{-1}(cx)\right)+11ibc\left(\cdots\right.\right.}{6c^4\left(-c^2\right)^{3/2}d^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(-5 + 6*c^2*x^2)
+ 2*a*(8 - 12*c^2*x^2 + 3*c^4*x^4) + 2*b*(8 - 12*c^2*x^2 + 3*c^4*x^4)*ArcSi
n[c*x]) + (11*I)*b*c*(1 - c^2*x^2)^(3/2)*EllipticF[I*ArcSinh[Sqrt[-c^2]*x],
 1]))/(6*c^4*(-c^2)^(3/2)*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] time = 0.316, size = 459, normalized size = 2.1

$$-\frac{ax^4}{c^2d}\left(-c^2dx^2+d\right)^{-\frac{3}{2}}+4\frac{ax^2}{dc^4\left(-c^2dx^2+d\right)^{3/2}}-\frac{8a}{3dc^6}\left(-c^2dx^2+d\right)^{-\frac{3}{2}}-\frac{b\arcsin(cx)x^2}{c^4d^3\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}-\frac{bx}{c^5d^3\left(c^2x^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -a*x^4/c^2/d/(-c^2*d*x^2+d)^(3/2)+4*a/c^4*x^2/d/(-c^2*d*x^2+d)^(3/2)-8/3*a/
c^6/d/(-c^2*d*x^2+d)^(3/2)-b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arc
sin(c*x)*x^2-b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2
)*x+b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)+2*b*(-d*(c^2*x
^2-1))^(1/2)/c^4/(c^2*x^2-1)^2/d^3*arcsin(c*x)*x^2-1/6*b*(-d*(c^2*x^2-1))^(
1/2)/c^5/(c^2*x^2-1)^2/d^3*(-c^2*x^2+1)^(1/2)*x-5/3*b*(-d*(c^2*x^2-1))^(1/2
)/c^6/(c^2*x^2-1)^2/d^3*arcsin(c*x)-11/6*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2
+1)^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+11/6*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1
)^(1/2)-I)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.4244, size = 1045, normalized size = 4.77

$$\left[\frac{11\left(bc^4x^4-2bc^2x^2+b\right)\sqrt{d}\log\left(-\frac{c^6dx^6+5c^4dx^4-5c^2dx^2-4\left(c^3x^3+cx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3c^4x^4+3c^2x^2-1}\right)-4\left(6bc^3x^3-5bcx\right)\sqrt{-c^2dx^2+d}\sqrt{}}{24\left(c^{10}d^3x^4-2c^8d^3x^2+c^6d^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/24*(11*(b*c^4*x^4 - 2*b*c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x
^4 - 5*c^2*d*x^2 - 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1
)*sqrt(d) - d)/(c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 4*(6*b*c^3*x^3 - 5*
b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 8*(3*a*c^4*x^4 - 12*a*c^2*
x^2 + (3*b*c^4*x^4 - 12*b*c^2*x^2 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2
 + d))/(c^10*d^3*x^4 - 2*c^8*d^3*x^2 + c^6*d^3), 1/12*(11*(b*c^4*x^4 - 2*b*
c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sq
rt(-d)*x/(c^4*d*x^4 - d)) - 2*(6*b*c^3*x^3 - 5*b*c*x)*sqrt(-c^2*d*x^2 + d)*
sqrt(-c^2*x^2 + 1) - 4*(3*a*c^4*x^4 - 12*a*c^2*x^2 + (3*b*c^4*x^4 - 12*b*c^
2*x^2 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2 + d))/(c^10*d^3*x^4 - 2*c^8
*d^3*x^2 + c^6*d^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^5}{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^5/(-c^2*d*x^2 + d)^(5/2), x)
```

3.131 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=212

$$-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc^5d^2\sqrt{d-c^2dx^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\,\mathrm{l}}{3c^5d^2\sqrt{d}}$$

```
[Out] -b/(6*c^5*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c
*x]))/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x]))/(c^4*d^2*Sq
rt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c^5*d^2
*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c^5*d^2
*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.30235, antiderivative size = 212, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4703, 4643, 4641, 260, 266, 43}

$$-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc^5d^2\sqrt{d-c^2dx^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\,\mathrm{l}}{3c^5d^2\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -b/(6*c^5*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c
*x]))/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x]))/(c^4*d^2*Sq
rt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c^5*d^2
*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c^5*d^2
*Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx=\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{\int\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{c^2d}-\frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{x^3}{\left(1-c^2x^2\right)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$=\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\int\frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{c^4d^2}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{x}{1-c^2x^2}\,dx}{c^3d^2\sqrt{d-c^2dx^2}}$$

$$=\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^5d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\int\frac{a+b}{\sqrt{}}}{c^4d^2\sqrt{d-}}$$

$$=-\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{x\left(a+b\sin^{-1}(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\left(a\right.}{2bc^5d^2}$$

Mathematica [A] time = 0.423924, size = 213, normalized size = 1.

$$\frac{\sqrt{d}\left(-8ac^3x^3+6acx+b\sqrt{1-c^2x^2}+4b\left(1-c^2x^2\right)^{3/2}\log\left(1-c^2x^2\right)\right)-6a\left(c^2x^2-1\right)\sqrt{d-c^2dx^2}\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(c^2x^2-1\right)}\right)-3}{6c^5d^{5/2}\left(c^2x^2-1\right)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-3*b*Sqrt[d]*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 - 6*a*(-1 + c^2*x^2)*Sqrt[d
 - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] +
Sqrt[d]*(6*a*c*x - 8*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 4*b*(1 - c^2*x^2)^(3
/2)*Log[1 - c^2*x^2]) + 2*b*Sqrt[d]*ArcSin[c*x]*Sin[3*ArcSin[c*x]])/(6*c^5*
d^(5/2)*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.277, size = 1510, normalized size = 7.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 1/3*a*x^3/c^2/d/(-c^2*d*x^2+d)^(3/2)-a/c^4/d^2*x/(-c^2*d*x^2+d)^(1/2)+a/c^4
/d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-8/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*(
-c^2*x^2+1)*x^5-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+
118*c^4*x^4-71*c^2*x^2+16)/c^5*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+22/3*I*b*(-d*
(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*x^
5+32*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2
*x^2+16)*c^2*arcsin(c*x)*x^7-4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*
c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c*(-c^2*x^2+1)^(1/2)*x^4+181/3*b*(-d*(c^
2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^2*a
rcsin(c*x)*x^3+13/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118
*c^4*x^4-71*c^2*x^2+16)/c^3*x^2*(-c^2*x^2+1)^(1/2)-16*b*(-d*(c^2*x^2-1))^(1
/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^4*arcsin(c*x)*x
+4/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c^2*x^2-1)*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8
-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*c^2*x^7+32*I*b*(-d*(c^2*x^2-1))^(1/2
)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*c*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)*x^6-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3
/(c^2*x^2-1)*arcsin(c*x)-20/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87
*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^2*x^3-1/2*b*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c*x)^2+220/3*I*b*(-d*(c^2*x^2-1
))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^3*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)*x^2-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*
c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^4*(-c^2*x^2+1)*x-84*I*b*(-d*(c^2*x^2-1
))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)*x^4+2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^
6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^4*x-8/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24
*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^5*(-c^2*x^2+1)^(1/2)-76*b*
(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16
)*arcsin(c*x)*x^5+14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^
6+118*c^4*x^4-71*c^2*x^2+16)/c^2*(-c^2*x^2+1)*x^3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(bx^4 \arcsin(cx) + ax^4\right)\sqrt{-c^2dx^2 + d}}{c^6d^3x^6 - 3\,c^4d^3x^4 + 3\,c^2d^3x^2 - d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4 (a + b \operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^4}{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(-c^2*d*x^2 + d)^(5/2), x)
```

3.132 $\int \frac{x^3(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=150

$$-\frac{a+b\sin^{-1}(cx)}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{a+b\sin^{-1}(cx)}{3c^4d\left(d-c^2dx^2\right)^{3/2}}-\frac{bx\sqrt{d-c^2dx^2}}{6c^3d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b\sqrt{d-c^2dx^2}\tanh^{-1}(cx)}{6c^4d^3\sqrt{1-c^2x^2}}$$

```
[Out] -(b*x*Sqrt[d - c^2*d*x^2])/(6*c^3*d^3*(1 - c^2*x^2)^(3/2)) + (a + b*ArcSin[
c*x])/(3*c^4*d*(d - c^2*d*x^2)^(3/2)) - (a + b*ArcSin[c*x])/(c^4*d^2*Sqrt[d
 - c^2*d*x^2]) + (5*b*Sqrt[d - c^2*d*x^2]*ArcTanh[c*x])/(6*c^4*d^3*Sqrt[1 -
 c^2*x^2])
```

Rubi [A] time = 0.197092, antiderivative size = 155, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4703, 4677, 206, 288}

$$-\frac{2\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{bx}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6c^4d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -(b*x)/(6*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcS
in[c*x]))/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x]))/(3*c^4*
d^2*Sqrt[d - c^2*d*x^2]) + (5*b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*c^4*d^2*
Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}dx = \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{2\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}dx}{3c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^2}{\left(1-c^2x^2\right)^2}dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{2\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(b\sqrt{1-c^2x^2}\right.}{6c^3d^2\sqrt{d}}$$

$$= -\frac{bx}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{2\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{5b\sqrt{1-c^2x^2}}{6c^4d^2\sqrt{d}}$$

Mathematica [C] time = 0.22869, size = 143, normalized size = 0.95

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(6ac^2x^2-4a-bcx\sqrt{1-c^2x^2}+2b\left(3c^2x^2-2\right)\sin^{-1}(cx)\right)-5ibc\left(1-c^2x^2\right)^{3/2}\text{EllipticF}\left(i\sinh^{-1}\left(\sqrt{\right.\right.}{6c^4\sqrt{-c^2}d^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(-4*a + 6*a*c^2*x^2 - b*c*x*Sqrt[1 - c^2*x
^2] + 2*b*(-2 + 3*c^2*x^2)*ArcSin[c*x]) - (5*I)*b*c*(1 - c^2*x^2)^(3/2)*Ell
ipticF[I*ArcSinh[Sqrt[-c^2]*x], 1]))/(6*c^4*Sqrt[-c^2]*d^3*(-1 + c^2*x^2)^2
)
```

Maple [C] time = 0.218, size = 307, normalized size = 2.1

$$\frac{ax^2}{c^2d}\left(-c^2dx^2+d\right)^{-\frac{3}{2}} - \frac{2a}{3dc^4}\left(-c^2dx^2+d\right)^{-\frac{3}{2}} + \frac{b\arcsin(cx)x^2}{d^3\left(c^2x^2-1\right)^2c^2}\sqrt{-d\left(c^2x^2-1\right)} - \frac{bx}{6d^3\left(c^2x^2-1\right)^2c^3}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] a*x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/3*a/d/c^4/(-c^2*d*x^2+d)^(3/2)+b*(-d*(c^
2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^2*arcsin(c*x)*x^2-1/6*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(c^2*x^2-1)^2/c^3*(-c^2*x^2+1)^(1/2)*x-2/3*b*(-d*(c^2*x^2-1))^(
1/2)/d^3/(c^2*x^2-1)^2/c^4*arcsin(c*x)-5/6*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)/c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+5/6*b*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+
1)^(1/2)-I)
```

Maxima [A] time = 1.62098, size = 216, normalized size = 1.44

$$\frac{1}{12}bc\left(\frac{2x}{c^6d^{\frac{5}{2}}x^2 - c^4d^{\frac{5}{2}}} + \frac{5\log(cx+1)}{c^5d^{\frac{5}{2}}} - \frac{5\log(cx-1)}{c^5d^{\frac{5}{2}}}\right) + \frac{1}{3}b\left(\frac{3x^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^2d} - \frac{2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^4d}\right)\arcsin(cx) + \frac{1}{3}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/12*b*c*(2*x/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) + 5*log(c*x + 1)/(c^5*d^(5/2)
) - 5*log(c*x - 1)/(c^5*d^(5/2))) + 1/3*b*(3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^
2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))*arcsin(c*x) + 1/3*a*(3*x^2/((-c^2*
d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))
```

Fricas [A] time = 2.29991, size = 913, normalized size = 6.09

$$\left[-\frac{4\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx - 5\left(bc^4x^4 - 2bc^2x^2 + b\right)\sqrt{d}\log\left(-\frac{c^6dx^6+5c^4dx^4-5c^2dx^2-4\left(c^3x^3+cx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3c^4x^4+3c^2x^2-1}\right) - 8}{24\left(c^8d^3x^4 - 2c^6d^3x^2 + c^4d^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/24*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - 5*(b*c^4*x^4 - 2*
b*c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 - 4*(c^3
*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 -
 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 8*(3*a*c^2*x^2 + (3*b*c^2*x^2 - 2*b)*arcsin(
c*x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3),
-1/12*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - 5*(b*c^4*x^4 - 2*b
*c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*s
qrt(-d)*x/(c^4*d*x^4 - d)) - 4*(3*a*c^2*x^2 + (3*b*c^2*x^2 - 2*b)*arcsin(c*
x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)x^3}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(-c^2*d*x^2 + d)^(5/2), x)
```

3.133 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=125

$$\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

```
[Out] -b/(6*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c
*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/
(6*c^3*d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.130668, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4681, 266, 43}

$$\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```


```
[Out] -b/(6*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c
*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/
(6*c^3*d^2*Sqrt[d - c^2*d*x^2])
```


Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x^3}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{x}{\left(1-c^2x\right)^2}\,dx, x, x^2\right)}{6d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \left(\frac{1}{c^2\left(-1+c^2x\right)^2}+\frac{1}{c^2\left(-1+c^2x\right)}\right)dx, x, x^2\right)}{6d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] time = 0.193043, size = 103, normalized size = 0.82

$$\frac{\sqrt{d-c^2dx^2}\left(2ac^3x^3-b\sqrt{1-c^2x^2}-b\left(1-c^2x^2\right)^{3/2}\log\left(c^2x^2-1\right)+2bc^3x^3\sin^{-1}(cx)\right)}{6c^3d^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(2*a*c^3*x^3 - b*Sqrt[1 - c^2*x^2] + 2*b*c^3*x^3*ArcSi
n[c*x] - b*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2]))/(6*c^3*d^3*(-1 + c^2*x^2
)^2)
```

Maple [C] time = 0.204, size = 1219, normalized size = 9.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 1/3*a/c^2/d*x/(-c^2*d*x^2+d)^(3/2)-1/3*a/c^2/d^2*x/(-c^2*d*x^2+d)^(1/2)+I*b
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^
3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^6+1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*
c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3-1/3*I*b*(-d*(c^2
*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)+b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+1
0*c^4*x^4-5*c^2*x^2+1)*c^4*arcsin(c*x)*x^7-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*x^4-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*
c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c
^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*x^5+4/3*I*b*(-d*(c^2*x^2-1))^(
1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*arcsin(c*x)*(-c^2*x
^2+1)^(1/2)*x^2-b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^
4-5*c^2*x^2+1)*c^2*arcsin(c*x)*x^5-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^
8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*(-c^2*x^2+1)*x^5+1/2*b*(-d*(c^2
*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*(-c^2*x^2
```

```
+1)^(1/2)*x^2-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^
4*x^4-5*c^2*x^2+1)*x^3-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*
x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7+1/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8
*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)*x^3-1/6*b*(-d*(c^2*x^2-1
))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^
(1/2)-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^3/(c^2*x^2-1)
*arcsin(c*x)+1/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^3/(c^2*x
^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [A] time = 1.67374, size = 207, normalized size = 1.66

$$\frac{1}{6}\,bc\left(\frac{1}{c^6d^{\frac{5}{2}}x^2-c^4d^{\frac{5}{2}}}-\frac{\log\left(cx+1\right)}{c^4d^{\frac{5}{2}}}-\frac{\log\left(cx-1\right)}{c^4d^{\frac{5}{2}}}\right)-\frac{1}{3}\,b\left(\frac{x}{\sqrt{-c^2dx^2+d}c^2d^2}-\frac{x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^2d}\right)\arcsin\left(cx\right)-\frac{1}{3}\,a\left(\frac{}{\sqrt{-c^2}\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*b*c*(1/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) - log(c*x + 1)/(c^4*d^(5/2)) - l
og(c*x - 1)/(c^4*d^(5/2))) - 1/3*b*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((
-c^2*d*x^2 + d)^(3/2)*c^2*d))*arcsin(c*x) - 1/3*a*(x/(sqrt(-c^2*d*x^2 + d)*
c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(bx^2\arcsin\left(cx\right)+ax^2\right)}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\,\text{asin}\left(cx\right)\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)x^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(-c^2*d*x^2 + d)^(5/2), x)
```

3.134 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=119

$$\frac{a+b\sin^{-1}(cx)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

```
[Out] -(b*x)/(6*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x]
)/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*c
^2*d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.080653, antiderivative size = 119, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12, Rules used = {4677, 199, 206}

$$\frac{a+b\sin^{-1}(cx)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -(b*x)/(6*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x]
)/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*c
^2*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{a+b\sin^{-1}(cx)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{1}{\left(1-c^2x^2\right)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{6cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] time = 0.0463611, size = 85, normalized size = 0.71

$$\frac{-2a+bcx\sqrt{1-c^2x^2}+b\left(1-c^2x^2\right)^{3/2}\tanh^{-1}(cx)-2b\sin^{-1}(cx)}{6c^2d^2\left(c^2x^2-1\right)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-2*a + b*c*x*Sqrt[1 - c^2*x^2] - 2*b*ArcSin[c*x] + b*(1 - c^2*x^2)^(3/2)*A
rcTanh[c*x])/(6*c^2*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.13, size = 259, normalized size = 2.2

$$\frac{a}{3c^2d}\left(-c^2dx^2+d\right)^{-\frac{3}{2}} - \frac{bx}{6d^3\left(c^4x^4-2c^2x^2+1\right)c}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1} + \frac{b\arcsin(cx)}{3d^3\left(c^4x^4-2c^2x^2+1\right)c^2}\sqrt{-d\left(c^2x^2-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 1/3*a/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-
2*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x+1/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x
^4-2*c^2*x^2+1)/c^2*arcsin(c*x)-1/6*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+1/6*b*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2
)+I)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 2.1984, size = 815, normalized size = 6.85

$$\left[-\frac{4\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx-\left(bc^4x^4-2\,bc^2x^2+b\right)\sqrt{d}\log\left(-\frac{c^6dx^6+5\,c^4dx^4-5\,c^2dx^2+4\left(c^3x^3+cx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3\,c^4x^4+3\,c^2x^2-1}\right)-8}{24\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/24*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - (b*c^4*x^4 - 2*b*
c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 + 4*(c^3*x
^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 - 3
*c^4*x^4 + 3*c^2*x^2 - 1)) - 8*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c
^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3), -1/12*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-
c^2*x^2 + 1)*b*c*x + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-
c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) - 4*sqrt(-c
^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\operatorname{asin}\left(cx\right)\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin\left(cx\right)+a)x}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(-c^2*d*x^2 + d)^(5/2), x)
```

3.135 $\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=154

$$\frac{2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

```
[Out] -b/(6*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x])
)/(3*d*(d - c^2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c
^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c*d^2*Sqrt[d - c^2*d
*x^2])
```

Rubi [A] time = 0.078979, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4655, 4653, 260, 261}

$$\frac{2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -b/(6*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x])
)/(3*d*(d - c^2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c
^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c*d^2*Sqrt[d - c^2*d
*x^2])
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c}}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(1-c\right.}{3cd^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] time = 0.238211, size = 113, normalized size = 0.73

$$-\frac{\sqrt{d-c^2dx^2}\left(4ac^3x^3-6acx+b\sqrt{1-c^2x^2}-2b\left(1-c^2x^2\right)^{3/2}\log\left(c^2x^2-1\right)+2bcx\left(2c^2x^2-3\right)\sin^{-1}(cx)\right)}{6cd^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -(Sqrt[d - c^2*d*x^2]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*c
*x*(-3 + 2*c^2*x^2)*ArcSin[c*x] - 2*b*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2]
))/(6*c*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] time = 0.125, size = 1071, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 1/3*a/d*x/(-c^2*d*x^2+d)^(3/2)+2/3*a/d^2*x/(-c^2*d*x^2+d)^(1/2)+2/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7-5/3*I*b
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x
^2+1)*x^3+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x
^2-4)*c^4*(-c^2*x^2+1)*x^5+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4
*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x+14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^
6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2-2*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)
*x^5-I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x-1
/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2
*x^2+1)^(1/2)*x^2+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^3/(
c^2*x^2-1)*arcsin(c*x)-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4
*x^4+11*c^2*x^2-4)*c^4*x^5+17/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*
c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^
```

```
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/3*
b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^
2+1)^(1/2)-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^
2-4)*c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4+8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3-4*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x-2/3*b*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)
```

Maxima [A] time = 1.76874, size = 190, normalized size = 1.23

$$\frac{1}{6}\,bc\left(\frac{1}{c^4d^{\frac{5}{2}}x^2-c^2d^{\frac{5}{2}}}+\frac{2\,\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}}+\frac{2\,\log\left(cx-1\right)}{c^2d^{\frac{5}{2}}}\right)+\frac{1}{3}\,b\left(\frac{2\,x}{\sqrt{-c^2dx^2+d}d^2}+\frac{x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}d}\right)\arcsin\left(cx\right)+\frac{1}{3}\,a\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*b*c*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2)) +
 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + x/
((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*(2*x/(sqrt(-c^2*d*x^2 + d)*
d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin\left(cx\right)+a)}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^6 - 3*c^4*d^3
*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\,\text{asin}\left(cx\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(-c^2*d*x^2 + d)^(5/2), x)
```

3.136 $\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=291

$$\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i}\right.}{d^2\sqrt{d}}$$

```
[Out] -(b*c*x)/(6*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x]
)/(3*d*(d - c^2*d*x^2)^(3/2)) + (a + b*ArcSin[c*x])/(d^2*Sqrt[d - c^2*d*x^2
]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(
d^2*Sqrt[d - c^2*d*x^2]) - (7*b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sqrt
[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/(
d^2*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*
x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.436844, antiderivative size = 291, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4705, 4713, 4709, 4183, 2279, 2391, 206, 199}

$$\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i}\right.}{d^2\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(b*c*x)/(6*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x]
)/(3*d*(d - c^2*d*x^2)^(3/2)) + (a + b*ArcSin[c*x])/(d^2*Sqrt[d - c^2*d*x^2
]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(
d^2*Sqrt[d - c^2*d*x^2]) - (7*b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sqrt
[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/(
d^2*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*
x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
```

```
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx}{d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{d^2} - \frac{\left(bc\sqrt{1\right.}{\ldots}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{d^2\sqrt{d-}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{d^2\sqrt{d-}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{d^2\sqrt{d-}}$$

Mathematica [A] time = 2.00069, size = 456, normalized size = 1.57

$$\frac{b\left(24i\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-24i\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+18\sqrt{1-c^2x^2}\sin^{-1}(cx)\log\left(1\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(a*(-4 + 3*c^2*x^2)*Sqrt[d - c^2*d*x^2])/(3*d^3*(-1 + c^2*x^2)^2) + (a*Log
[x])/d^(5/2) - (a*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/d^(5/2) + (b*(20*Ar
cSin[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 18*Sqrt[1 - c^2*x^2]*ArcSin
[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 -
 E^(I*ArcSin[c*x])] - 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*ArcSin[
c*x])] - 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*ArcSin[c*x])] + 21*S
qrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 7*Cos[3*Arc
Sin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 21*Sqrt[1 - c^2*x^
2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 7*Cos[3*ArcSin[c*x]]*Log[
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + (24*I)*(1 - c^2*x^2)^(3/2)*PolyL
og[2, -E^(I*ArcSin[c*x])] - (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, E^(I*ArcS
in[c*x])] - 2*Sin[2*ArcSin[c*x]]))/(24*d*(d - c^2*d*x^2)^(3/2))
```

Maple [A] time = 0.154, size = 449, normalized size = 1.5

$$\frac{a}{3\,d}\left(-c^2dx^2+d\right)^{-\frac{3}{2}} + \frac{a}{d^2}\frac{1}{\sqrt{-c^2dx^2+d}} - a\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)d^{-\frac{5}{2}} - \frac{b\arcsin(cx)\,x^2c^2}{d^3\left(c^2x^2-1\right)^2}\sqrt{-d\left(c^2x^2-1\right)} - $$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 1/3*a/d/(-c^2*d*x^2+d)^(3/2)+a/d^2/(-c^2*d*x^2+d)^(1/2)-a/d^(5/2)*ln((2*d+2
*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^
2*arcsin(c*x)*x^2*c^2-1/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*(-c^2*
x^2+1)^(1/2)*x*c+4/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)
-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*arctan(I
*c*x+(-c^2*x^2+1)^(1/2))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/
(c^2*x^2-1)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+b*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^6d^3x^7-3\,c^4d^3x^5+3\,c^2d^3x^3-d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^7 - 3*c^4*d^3
*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\arcsin(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x), x)
```

3.137 $\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=224

$$\frac{8c^2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{4c^2x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{d^3\sqrt{1-c^2x^2}}+\frac{5bc\sqrt{d-}}{}$$

```
[Out] -(b*c*Sqrt[d - c^2*d*x^2])/(6*d^3*(1 - c^2*x^2)^(3/2)) - (a + b*ArcSin[c*x]
)/(d*x*(d - c^2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x]))/(3*d*(d - c^2
*d*x^2)^(3/2)) + (8*c^2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2])
+ (b*c*Sqrt[d - c^2*d*x^2]*Log[x])/(d^3*Sqrt[1 - c^2*x^2]) + (5*b*c*Sqrt[d
- c^2*d*x^2]*Log[1 - c^2*x^2])/(6*d^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.219503, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4701, 4655, 4653, 260, 261, 266, 44}

$$\frac{8c^2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{4c^2x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}-\frac{bc}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log(x)}{d^2\sqrt{d-c^2dx^2}}+$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(b*c)/(6*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])/
(d*x*(d - c^2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d
*x^2)^(3/2)) + (8*c^2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) +
(b*c*Sqrt[1 - c^2*x^2]*Log[x])/(d^2*Sqrt[d - c^2*d*x^2]) + (5*b*c*Sqrt[1 -
c^2*x^2]*Log[1 - c^2*x^2])/(6*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}+\left(4c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{5/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x\left(1-c^2x^2\right)^2}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{4c^2x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(8c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3d}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\text{Subs}}{2d^2\sqrt{d}}$$

$$= -\frac{2bc}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{4c^2x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{8c^2x\left(a+b\sin^{-1}\right.}{3d^2\sqrt{d-c^2dx}}$$

$$= -\frac{bc}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{4c^2x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{8c^2x\left(a+b\sin^{-1}\right.}{3d^2\sqrt{d-c^2dx}}$$

Mathematica [A] time = 0.296587, size = 188, normalized size = 0.84

$$-\frac{\sqrt{d-c^2dx^2}\left(16ac^4x^4-24ac^2x^2+6a+bcx\sqrt{1-c^2x^2}+5bc^3x^3\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)-3bcx\left(1-c^2x^2\right)^{3/2}\log\left(x^2\right)-\right.}{6d^3x\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(Sqrt[d - c^2*d*x^2]*(6*a - 24*a*c^2*x^2 + 16*a*c^4*x^4 + b*c*x*Sqrt[1 - c
^2*x^2] + 2*b*(3 - 12*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x] - 3*b*c*x*(1 - c^2*x
^2)^(3/2)*Log[x^2] - 5*b*c*x*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] + 5*b*c^3*x
^3*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]))/(6*d^3*x*(-1 + c^2*x^2)^2)
```

Maple [C] time = 0.204, size = 1346, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -a/d/x/(-c^2*d*x^2+d)^(3/2)+4/3*a*c^2/d*x/(-c^2*d*x^2+d)^(3/2)+8/3*a*c^2/d^
2*x/(-c^2*d*x^2+d)^(1/2)-5/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^
3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c-44*b*(-d*(c^2*x^2-1))^(1
/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)*c^2-64/3*I*b*(-d*
(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^4*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*c^5-80/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^
4+26*c^2*x^2-9)/d^3*x^5*(-c^2*x^2+1)*c^6-24*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c
^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*c^4+16/3*I*b*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*c+136/3*I*b*(-d*(c^2*x^2-1)
)^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*c^3+140/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x
^2-9)/d^3*x^5*c^6+4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2
*x^2-9)/d^3*x*c^2+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*
c^2*x^2-9)/d^3*x^9*c^10-64/3*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4
+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)*c^6-4/3*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*
x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2)*c^3+56*b*(-d*(c^2*x
^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)*c^4-b*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln((I*c*x+(-c^2*x
^2+1)^(1/2))^2-1)*c-4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c
^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2-24*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-2
5*c^4*x^4+26*c^2*x^2-9)/d^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+32/3*I*b*(-d*(
c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*(-c^2*x^2+1)*
c^8+9*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3/x*ar
csin(c*x)+3/2*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/
d^3*(-c^2*x^2+1)^(1/2)*c-112/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4
*x^4+26*c^2*x^2-9)/d^3*x^7*c^8+20*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*
c^4*x^4+26*c^2*x^2-9)/d^3*x^3*(-c^2*x^2+1)*c^4
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^6d^3x^8-3c^4d^3x^6+3c^2d^3x^4-d^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^8 - 3*c^4*d^3
*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^2), x)
```

3.138 $\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=433

$$\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}-\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{2d^2\sqrt{d-c^2dx^2}}-\frac{5c^2\sqrt{1-c^2x^2}}{}$$

```
[Out] (b*c)/(4*d^2*x*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (5*b*c^3*x)/(12*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (3*b*c*Sqrt[1 - c^2*x^2])/(4*d^2*
x*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x]))/(6*d*(d - c^2*d*x^2)^(
3/2)) - (a + b*ArcSin[c*x])/(2*d*x^2*(d - c^2*d*x^2)^(3/2)) + (5*c^2*(a + b
*ArcSin[c*x]))/(2*d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (13*
b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)
/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c
^2*d*x^2]) - (((5*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x]
)])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.582206, antiderivative size = 433, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4701, 4705, 4713, 4709, 4183, 2279, 2391, 206, 199, 290, 325}

$$\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}-\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{2d^2\sqrt{d-c^2dx^2}}-\frac{5c^2\sqrt{1-c^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```


```
[Out] (b*c)/(4*d^2*x*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (5*b*c^3*x)/(12*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (3*b*c*Sqrt[1 - c^2*x^2])/(4*d^2*
x*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x]))/(6*d*(d - c^2*d*x^2)^(
3/2)) - (a + b*ArcSin[c*x])/(2*d*x^2*(d - c^2*d*x^2)^(3/2)) + (5*c^2*(a + b
*ArcSin[c*x]))/(2*d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (13*
b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)
/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c
^2*d*x^2]) - (((5*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x]
)])/(d^2*Sqrt[d - c^2*d*x^2])
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 290

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[((
c*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*n*(p + 1)), x] + Dist[(m + n*(p + 1)
 + 1)/(a*n*(p + 1)), Int[(c*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a, b
, c, m}, x] && IGtQ[n, 0] && LtQ[p, -1] && IntBinomialQ[a, b, c, n, m, p, x
]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{2dx^2\left(d-c^2dx^2\right)^{3/2}}+\frac{1}{2}\left(5c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^2\left(1-c^2x^2\right)^2}\,dx}{2d^2\sqrt{d-c^2dx^2}}$$

$$=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(cx)\right)}{6d\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{2dx^2\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(5c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{3/2}}}{2d}$$

$$=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(c\right.}{6d\left(d-c^2dx^2\right)^{3/}}$$

$$=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(c\right.}{6d\left(d-c^2dx^2\right)^{3/}}$$

$$=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(c\right.}{6d\left(d-c^2dx^2\right)^{3/}}$$

$$=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(c\right.}{6d\left(d-c^2dx^2\right)^{3/}}$$

$$=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(c\right.}{6d\left(d-c^2dx^2\right)^{3/}}$$

$$=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(c\right.}{6d\left(d-c^2dx^2\right)^{3/}}$$

Mathematica [A] time = 7.48286, size = 537, normalized size = 1.24

$$bc^2\sqrt{1-c^2x^2}\left(60i\left(\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\right)-\frac{2\left(\sin^{-1}(cx)-1\right)}{cx-1}+52\sin^{-1}(cx)+60\sin^{-1}(cx)\left(\log\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-a/(2*d^3*x^2) + (a*c^2)/(3*d^3*(-1 + c^2*x^2)^2
) - (2*a*c^2)/(d^3*(-1 + c^2*x^2))) + (5*a*c^2*Log[x])/(2*d^(5/2)) - (5*a*c
^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/(2*d^(5/2)) + (b*c^2*Sqrt[1
- c^2*x^2]*((-2*(-1 + ArcSin[c*x]))/(-1 + c*x) + 52*ArcSin[c*x] - 6*Cot[Arc
Sin[c*x]/2] - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 60*ArcSin[c*x]*(Log[1 -
E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + 52*Log[Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2]] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] +
 (60*I)*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) +
3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + (4*ArcSin[c*x]*Sin[ArcSin[c*x]/2])/(Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (52*ArcSin[c*x]*Sin[ArcSin[c*x]/
2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x]*Sin[ArcSin[c
*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*(1 + ArcSin[c*x]))
/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (52*ArcSin[c*x]*Sin[ArcSin[c
*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*Tan[ArcSin[c*x]/2]))/
(24*d^2*Sqrt[d*(1 - c^2*x^2)])
```

Maple [A] time = 0.279, size = 624, normalized size = 1.4

$$-\frac{a}{2\,dx^2}\left(-c^2dx^2+d\right)^{-\frac{3}{2}}+\frac{5\,ac^2}{6\,d}\left(-c^2dx^2+d\right)^{-\frac{3}{2}}+\frac{5\,ac^2}{2\,d^2}\frac{1}{\sqrt{-c^2dx^2+d}}-\frac{5\,ac^2}{2}\ln\left(\frac{1}{x}\left(2\,d+2\,\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)d^{-\frac{5}{2}}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -1/2*a/d/x^2/(-c^2*d*x^2+d)^(3/2)+5/6*a*c^2/d/(-c^2*d*x^2+d)^(3/2)+5/2*a*c^
2/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*a*c^2/d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+
d)^(1/2))/x)-5/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*arc
sin(c*x)*c^4+1/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x*c^3*(
-c^2*x^2+1)^(1/2)+10/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*a
rcsin(c*x)*c^2-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x*(-c
^2*x^2+1)^(1/2)*c-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x^
2*arcsin(c*x)+5/2*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-
1)*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-13/3*I*b*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arctan(I*c*x+(-c^2*x^2+1)^(1/
2))-5/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*d
ilog(I*c*x+(-c^2*x^2+1)^(1/2))-5/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/d^3/(c^2*x^2-1)*c^2*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^6d^3x^9-3\,c^4d^3x^7+3\,c^2d^3x^5-d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^9 - 3*c^4*d^3
*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(-c^2dx^2 + d\right)^{\frac{5}{2}} x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^3), x)
```

3.139 $\int \frac{a+b\sin^{-1}(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=310

$$\frac{16c^4x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2\left(a+b\sin^{-1}(cx)\right)}{dx\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{bc^3\sqrt{d-c^2dx^2}}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{}{6}$$

```
[Out] -(b*c^3*Sqrt[d - c^2*d*x^2])/(6*d^3*(1 - c^2*x^2)^(3/2)) - (b*c*Sqrt[d - c^
2*d*x^2])/(6*d^3*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(3*d*x^3*(d -
 c^2*d*x^2)^(3/2)) - (2*c^2*(a + b*ArcSin[c*x]))/(d*x*(d - c^2*d*x^2)^(3/2)
) + (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x*(
a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) + (8*b*c^3*Sqrt[d - c^2*d*x
^2]*Log[x])/(3*d^3*Sqrt[1 - c^2*x^2]) + (4*b*c^3*Sqrt[d - c^2*d*x^2]*Log[1
- c^2*x^2])/(3*d^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.387039, antiderivative size = 310, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4701, 4655, 4653, 260, 261, 266, 44}

$$\frac{16c^4x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2\left(a+b\sin^{-1}(cx)\right)}{dx\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{bc^3}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(b*c^3)/(6*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*
x^2])/(6*d^2*x^2*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])/(3*d*x^3*(d - c
^2*d*x^2)^(3/2)) - (2*c^2*(a + b*ArcSin[c*x]))/(d*x*(d - c^2*d*x^2)^(3/2))
+ (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x*(a
+ b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) + (8*b*c^3*Sqrt[1 - c^2*x^2]*
Log[x])/(3*d^2*Sqrt[d - c^2*d*x^2]) + (4*b*c^3*Sqrt[1 - c^2*x^2]*Log[1 - c^
2*x^2])/(3*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

```
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} + \left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^3\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)}{dx\left(d-c^2dx^2\right)^{3/2}} + \left(8c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\mathrm{Su}}{6d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{8c^4x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(16c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3d}$$

$$= -\frac{7bc^3}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}}{6d^2x^2\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)}{dx\left(d-c^2dx^2\right)^{3/2}} +$$

$$= -\frac{bc^3}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}}{6d^2x^2\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)}{dx\left(d-c^2dx^2\right)^{3/2}} +$$

Mathematica [A] time = 0.345004, size = 213, normalized size = 0.69

$$-\frac{\sqrt{d-c^2dx^2}\left(32ac^6x^6-48ac^4x^4+12ac^2x^2+2a+bcx\sqrt{1-c^2x^2}+8bc^5x^5\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)-8bc^3x^3\left(1-c^2x^2\right.\right.}{6d^3x^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(Sqrt[d - c^2*d*x^2]*(2*a + 12*a*c^2*x^2 - 48*a*c^4*x^4 + 32*a*c^6*x^6 + b
*c*x*Sqrt[1 - c^2*x^2] + 2*b*(1 + 6*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x^6)*ArcS
in[c*x] - 8*b*c^3*x^3*(1 - c^2*x^2)^(3/2)*Log[x^2] - 8*b*c^3*x^3*Sqrt[1 - c
^2*x^2]*Log[1 - c^2*x^2] + 8*b*c^5*x^5*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]))
/(6*d^3*x^3*(-1 + c^2*x^2)^2)
```

Maple [C] time = 0.261, size = 1875, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 2*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/
d^3*c^3*(-c^2*x^2+1)^(1/2)+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*
x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3/x^3*arcsin(c*x)+8/3*a*c^4/d*x/(-c^2*d*x^2+
d)^(3/2)+16/3*a*c^4/d^2*x/(-c^2*d*x^2+d)^(1/2)-2*a*c^2/d/x/(-c^2*d*x^2+d)^(
3/2)+6*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^
2-1)/d^3/x*arcsin(c*x)*c^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*
x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3/x^2*(-c^2*x^2+1)^(1/2)*c-8/3*b*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2)
)^4-1)*c^3-64*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10
*c^2*x^2-1)/d^3*x^7*arcsin(c*x)*c^10+160*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x
^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^5*arcsin(c*x)*c^8-344/3*b*(-d*
(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^3*
arcsin(c*x)*c^6+8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^
4*x^4-10*c^2*x^2-1)/d^3*x*c^4-2*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6
*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^2*c^5*(-c^2*x^2+1)^(1/2)+12*b*(-d*(c^2*
x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x*arcsin(
c*x)*c^4+128/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4
-10*c^2*x^2-1)/d^3*x^11*c^14-448/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-3
6*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^9*c^12+560/3*I*b*(-d*(c^2*x^2-1))^
(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^7*c^10-280/3*I*
b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^
3*x^5*c^8+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4
-10*c^2*x^2-1)/d^3*x^3*c^6+80*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6
*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^5*(-c^2*x^2+1)*c^8+32/3*I*b*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*c^3-16/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*c^3-40/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8
-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^3*(-c^2*x^2+1)*c^6-8/3*I*b*(-d*(
c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x*(-c
^2*x^2+1)*c^4+128/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^
4*x^4-10*c^2*x^2-1)/d^3*x^9*(-c^2*x^2+1)*c^12-320/3*I*b*(-d*(c^2*x^2-1))^(1
/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^7*(-c^2*x^2+1)*c^
```

```
10-1/3*a/d/x^3/(-c^2*d*x^2+d)^(3/2)+128*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*
x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^4*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*c^7-64*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*
c^2*x^2-1)/d^3*x^6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9-176/3*I*b*(-d*(c^2*x^
2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^2*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^5
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{c^6d^3x^{10}-3c^4d^3x^8+3c^2d^3x^6-d^3x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^10 - 3*c^4*d^
3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\arcsin(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^4), x)
```

3.140 $\int \frac{\sin^{-1}(ax)}{(c-a^2cx^2)^{7/2}}\,dx$

Optimal. Leaf size=210

$$-\frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}-\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}+\frac{4\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{15ac^3\sqrt{c-a^2cx^2}}+\frac{8x\sin^{-1}(ax)}{15c^3\sqrt{c-a^2cx^2}}+\frac{4x}{15c^2}$$

```
[Out] -1/(20*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - 2/(15*a*c^3*Sqrt[1
- a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(5*c*(c - a^2*c*x^2)^(5/2
)) + (4*x*ArcSin[a*x])/(15*c^2*(c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x])/(
15*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(15*a*
c^3*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.115313, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4655, 4653, 260, 261}

$$-\frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}-\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}+\frac{4\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{15ac^3\sqrt{c-a^2cx^2}}+\frac{8x\sin^{-1}(ax)}{15c^3\sqrt{c-a^2cx^2}}+\frac{4x}{15c^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(c - a^2*c*x^2)^(7/2),x]
```


```
[Out] -1/(20*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - 2/(15*a*c^3*Sqrt[1
- a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(5*c*(c - a^2*c*x^2)^(5/2
)) + (4*x*ArcSin[a*x])/(15*c^2*(c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x])/(
15*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(15*a*
c^3*Sqrt[c - a^2*c*x^2])
```


Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)}{\left(c-a^2cx^2\right)^{7/2}}\,dx = \frac{x\sin^{-1}(ax)}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4\int \frac{\sin^{-1}(ax)}{\left(c-a^2cx^2\right)^{5/2}}\,dx}{5c} - \frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{\left(1-a^2x^2\right)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4x\sin^{-1}(ax)}{15c^2\left(c-a^2cx^2\right)^{3/2}} + \frac{8\int \frac{\sin^{-1}(ax)}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{15c^2} - \cdots$$

$$= -\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4x\sin^{-1}(a\cdots}{15c^2\left(c-a^2c\cdots\right.}$$

$$= -\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4x\sin^{-1}(a\cdots}{15c^2\left(c-a^2c\cdots\right.}$$

Mathematica [A] time = 0.216464, size = 111, normalized size = 0.53

$$-\frac{\sqrt{c-a^2cx^2}\left(\sqrt{1-a^2x^2}\left(8a^2x^2+16\left(a^2x^2-1\right)^2\log\left(a^2x^2-1\right)-11\right)+4ax\left(8a^4x^4-20a^2x^2+15\right)\sin^{-1}(ax)\right)}{60ac^4\left(a^2x^2-1\right)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -(Sqrt[c - a^2*c*x^2]*(4*a*x*(15 - 20*a^2*x^2 + 8*a^4*x^4)*ArcSin[a*x] + Sq
rt[1 - a^2*x^2]*(-11 + 8*a^2*x^2 + 16*(-1 + a^2*x^2)^2*Log[-1 + a^2*x^2])))
/(60*a*c^4*(-1 + a^2*x^2)^3)
```

Maple [C] time = 0.217, size = 409, normalized size = 2.

$$\frac{\frac{16i}{15}\arcsin(ax)}{ac^4\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1} - \frac{1}{60c^4\left(40a^{10}x^{10}-215x^8a^8+469a^6x^6-517a^4x^4+287a^2x^2-64\right)a}\sqrt{-c\left(a\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x)
```

```
[Out] 16/15*I*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*arcsin(
a*x)-1/60*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/
2)*x^4*a^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+8*I*(-a^2*x^2+1)^(1/2))*(
64*I*x^8*a^8+64*(-a^2*x^2+1)^(1/2)*x^7*a^7-280*I*x^6*a^6-248*(-a^2*x^2+1)^(
1/2)*a^5*x^5+160*a^4*x^4*arcsin(a*x)+456*I*x^4*a^4+340*a^3*x^3*(-a^2*x^2+1)
^(1/2)-380*a^2*x^2*arcsin(a*x)-328*I*a^2*x^2-165*a*x*(-a^2*x^2+1)^(1/2)+256
*arcsin(a*x)+88*I)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+28
```

```
7*a^2*x^2-64)/a-8/15*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x
^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)
```

Maxima [A] time = 1.70594, size = 209, normalized size = 1.

$$-\frac{1}{60}a\left(\frac{16\sqrt{\frac{1}{a^4c}}\log\left(x^2-\frac{1}{a^2}\right)}{c^3}+\frac{3}{\left(a^6c^{\frac{5}{2}}x^4-2\,a^4c^{\frac{5}{2}}x^2+a^2c^{\frac{5}{2}}\right)c}-\frac{8}{\left(a^4c^{\frac{3}{2}}x^2-a^2c^{\frac{3}{2}}\right)c^2}\right)+\frac{1}{15}\left(\frac{8\,x}{\sqrt{-a^2cx^2+c}c^3}+\frac{4\,x}{\left(-a^2cx^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] -1/60*a*(16*sqrt(1/(a^4*c))*log(x^2 - 1/a^2)/c^3 + 3/((a^6*c^(5/2)*x^4 - 2*
a^4*c^(5/2)*x^2 + a^2*c^(5/2))*c) - 8/((a^4*c^(3/2)*x^2 - a^2*c^(3/2))*c^2)
) + 1/15*(8*x/(sqrt(-a^2*c*x^2 + c)*c^3) + 4*x/((-a^2*c*x^2 + c)^(3/2)*c^2)
 + 3*x/((-a^2*c*x^2 + c)^(5/2)*c))*arcsin(a*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)}{a^8c^4x^8-4\,a^6c^4x^6+6\,a^4c^4x^4-4\,a^2c^4x^2+c^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 + 6*
a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/(-a**2*c*x**2+c)**(7/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.43052, size = 173, normalized size = 0.82

$$-\frac{1}{60}\sqrt{c}\left(\frac{16\log\left(\left|a^2x^2-1\right|\right)}{ac^4}-\frac{24\,a^4x^4-56\,a^2x^2+35}{\left(a^2x^2-1\right)^2ac^4}\right)-\frac{\sqrt{-a^2cx^2+c}\left(4\left(\frac{2\,a^4x^2}{c}-\frac{5\,a^2}{c}\right)x^2+\frac{15}{c}\right)x\arcsin(ax)}{15\left(a^2cx^2-c\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] -1/60*sqrt(c)*(16*log(abs(a^2*x^2 - 1))/(a*c^4) - (24*a^4*x^4 - 56*a^2*x^2
+ 35)/((a^2*x^2 - 1)^2*a*c^4)) - 1/15*sqrt(-a^2*c*x^2 + c)*(4*(2*a^4*x^2/c
- 5*a^2/c)*x^2 + 15/c)*x*arcsin(a*x)/(a^2*c*x^2 - c)^3
```

3.141 $\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx$

Optimal. Leaf size=79

$$\frac{2(fx)^{5/2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{5f}-\frac{4bc(fx)^{7/2}\text{HypergeometricPFQ}\left(\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\}\right.}{35f^2}$$

```
[Out] (2*(f*x)^(5/2)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 5/4, 9/4, c^2*x^2
])/(5*f) - (4*b*c*(f*x)^(7/2)*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4},
 c^2*x^2])/(35*f^2)
```

Rubi [A] time = 0.102276, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.033, Rules used = {4711}

$$\frac{2(fx)^{5/2}\,{}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{5f}-\frac{4bc(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2],x]
```

```
[Out] (2*(f*x)^(5/2)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 5/4, 9/4, c^2*x^2
])/(5*f) - (4*b*c*(f*x)^(7/2)*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4},
 c^2*x^2])/(35*f^2)
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx=\frac{2(fx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,{}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)}{5f}-\frac{4bc(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2}$$

Mathematica [A] time = 0.0511556, size = 68, normalized size = 0.86

$$\frac{2}{35}x(fx)^{3/2}\left(7\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-2bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2],x]
```

```
[Out] (2*x*(f*x)^(3/2)*(7*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 5/4, 9/4, c^
2*x^2] - 2*b*c*x*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, c^2*x^2]))/3
```

5

Maple [F] time = 0.247, size = 0, normalized size = 0.

$$\int \left(a+b\arcsin \left(c x\right)\right) \left(f x\right)^{\frac{3}{2}} \frac{1}{\sqrt{-c^{2} x^{2}+1}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(f x\right)^{\frac{3}{2}} \left(b \arcsin \left(c x\right) + a\right)}{\sqrt{-c^{2} x^{2} + 1}}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="ma
xima")
```

```
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-c^{2} x^{2} + 1} {\left(b f x \arcsin \left(c x\right) + a f x\right)} \sqrt{f x}}{c^{2} x^{2} - 1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*(b*f*x*arcsin(c*x) + a*f*x)*sqrt(f*x)/(c^2*x^2
 - 1), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(3/2)*(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)}{\sqrt{-c^{2}x^{2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="gi
ac")

[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*x^2 + 1), x)
```

3.142 $\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=137

$$\frac{2\sqrt{1-c^2x^2}(fx)^{5/2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{5f\sqrt{d-c^2dx^2}}-\frac{4bc\sqrt{1-c^2x^2}(fx)^{7/2}\text{HypergeometricPFQ}(}{35f^2\sqrt{d-c^2dx^2}}$$

```
[Out] (2*(f*x)^(5/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2,
 5/4, 9/4, c^2*x^2])/(5*f*Sqrt[d - c^2*d*x^2]) - (4*b*c*(f*x)^(7/2)*Sqrt[1
- c^2*x^2]*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, c^2*x^2])/(35*f^2*
Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.216347, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065, Rules used = {4713, 4711}

$$\frac{2\sqrt{1-c^2x^2}(fx)^{5/2}\,{}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{5f\sqrt{d-c^2dx^2}}-\frac{4bc\sqrt{1-c^2x^2}(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*(f*x)^(5/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2,
 5/4, 9/4, c^2*x^2])/(5*f*Sqrt[d - c^2*d*x^2]) - (4*b*c*(f*x)^(7/2)*Sqrt[1
- c^2*x^2]*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, c^2*x^2])/(35*f^2*
Sqrt[d - c^2*d*x^2])
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\ &= \frac{2(fx)^{5/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\,{}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)}{5f\sqrt{d-c^2dx^2}}-\frac{4bc(fx)^{7/2}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,\frac{7}{4},\right.}{35f^2\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] time = 0.0419652, size = 97, normalized size = 0.71

$$-\frac{2x\sqrt{1-c^2x^2}(fx)^{3/2}\left(2bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\},c^2x^2\right)-7\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)(\right.}{35\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (-2*x*(f*x)^(3/2)*Sqrt[1 - c^2*x^2]*(-7*(a + b*ArcSin[c*x])*Hypergeometric2
F1[1/2, 5/4, 9/4, c^2*x^2] + 2*b*c*x*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4,
 11/4}, c^2*x^2]))/(35*Sqrt[d - c^2*d*x^2])
```

Maple [F] time = 0.529, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(fx)^{\frac{3}{2}}\frac{1}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^{\frac{3}{2}}(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(bfx\arcsin(cx)+afx\right)\sqrt{fx}}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*f*x*arcsin(c*x) + a*f*x)*sqrt(f*x)/(c^2*d
*x^2 - d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(3/2)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^{\frac{3}{2}}(b \arcsin(cx) + a)}{\sqrt{-c^2dx^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

3.143 $\int x^m \left(d-c^2 d x^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=315

$$-\frac{3bcd^3\left(35m^3+455m^2+1813m+2161\right)x^{m+2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{(m+1)(m+2)(m+3)^2(m+5)^2(m+7)^2}-\frac{3c^2d^3x^{m+3}\left(a+b\sin^{-1}(cx\right.}{m+3}$$

```
[Out] -((b*c*d^3*(2271 + 1329*m + 284*m^2 + 27*m^3 + m^4)*x^(2 + m)*Sqrt[1 - c^2*
x^2])/((3 + m)^2*(5 + m)^2*(7 + m)^2)) + (b*c^3*d^3*(9 + m)*(13 + 2*m)*x^(4
 + m)*Sqrt[1 - c^2*x^2])/((5 + m)^2*(7 + m)^2) - (b*c^5*d^3*x^(6 + m)*Sqrt[
1 - c^2*x^2])/(7 + m)^2 + (d^3*x^(1 + m)*(a + b*ArcSin[c*x]))/(1 + m) - (3*
c^2*d^3*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) + (3*c^4*d^3*x^(5 + m)*(a +
b*ArcSin[c*x]))/(5 + m) - (c^6*d^3*x^(7 + m)*(a + b*ArcSin[c*x]))/(7 + m) -
 (3*b*c*d^3*(2161 + 1813*m + 455*m^2 + 35*m^3)*x^(2 + m)*Hypergeometric2F1[
1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2*(
7 + m)^2)
```

Rubi [A] time = 2.16443, antiderivative size = 315, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {270, 4687, 12, 1809, 1267, 459, 364}

$$-\frac{3c^2d^3x^{m+3}\left(a+b\sin^{-1}(cx)\right)}{m+3}+\frac{3c^4d^3x^{m+5}\left(a+b\sin^{-1}(cx)\right)}{m+5}-\frac{c^6d^3x^{m+7}\left(a+b\sin^{-1}(cx)\right)}{m+7}+\frac{d^3x^{m+1}\left(a+b\sin^{-1}(cx)\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```


```
[Out] -((b*c*d^3*(2271 + 1329*m + 284*m^2 + 27*m^3 + m^4)*x^(2 + m)*Sqrt[1 - c^2*
x^2])/((3 + m)^2*(5 + m)^2*(7 + m)^2)) + (b*c^3*d^3*(9 + m)*(13 + 2*m)*x^(4
 + m)*Sqrt[1 - c^2*x^2])/((5 + m)^2*(7 + m)^2) - (b*c^5*d^3*x^(6 + m)*Sqrt[
1 - c^2*x^2])/(7 + m)^2 + (d^3*x^(1 + m)*(a + b*ArcSin[c*x]))/(1 + m) - (3*
c^2*d^3*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) + (3*c^4*d^3*x^(5 + m)*(a +
b*ArcSin[c*x]))/(5 + m) - (c^6*d^3*x^(7 + m)*(a + b*ArcSin[c*x]))/(7 + m) -
 (3*b*c*d^3*(2161 + 1813*m + 455*m^2 + 35*m^3)*x^(2 + m)*Hypergeometric2F1[
1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2*(
7 + m)^2)
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1809

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[(f*(c*x)^(m + q -
1)*(a + b*x^2)^(p + 1))/(b*c^(q - 1)*(m + q + 2*p + 1)), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 1267

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[(c^p*(f*x)^(m + 4*p - 1)*(d + e*x^2)^
(q + 1))/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1)), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = \frac{d^3x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m} - \frac{3c^2d^3x^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m} + \frac{3c^4d^3x^{5+m}\left(a+b\right.}{5+m}$$

$$= \frac{d^3x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m} - \frac{3c^2d^3x^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m} + \frac{3c^4d^3x^{5+m}\left(a+b\right.}{5+m}$$

$$= -\frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2} + \frac{d^3x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m} - \frac{3c^2d^3x^{3+m}\left(a+b\sin^{-1}\right.}{3+m}$$

$$= \frac{bc^3d^3(9+m)(13+2m)x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2(7+m)^2} - \frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2} + \frac{d^3x^{1+m}\left(a\right.}{1}$$

$$= -\frac{bcd^3\left(2271+1329m+284m^2+27m^3+m^4\right)x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2(7+m)^2} + \frac{bc^3d^3(9+}{(}$$

$$= -\frac{bcd^3\left(2271+1329m+284m^2+27m^3+m^4\right)x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2(7+m)^2} + \frac{bc^3d^3(9+}{(}$$

Mathematica [A] time = 0.550445, size = 256, normalized size = 0.81

$$\frac{x^{m+1}\left(\frac{6d\left(-\frac{4d^2\left(bc(m+1)x\text{Hypergeometric2F1}\left(-\frac{1}{2},\frac{m}{2}+1,\frac{m}{2}+2,c^2x^2\right)+2bcx\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2}+1,\frac{m}{2}+2,c^2x^2\right)+(m+2)\left(m\left(c^2x^2-1\right)+c^2x^2-3\right)\left(a+b\sin^{-1}(cx)\right)\right)}{(m+1)(m+2)(m+3)}-\frac{bcd^2x\text{Hyper}}{}\right.}{m+5}\right.}{m}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]) - (b*c*d^3*x*Hypergeometr
ic2F1[-5/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2 + m) + (6*d*((d - c^2*d*x^2)^2*(
a + b*ArcSin[c*x]) - (b*c*d^2*x*Hypergeometric2F1[-3/2, 1 + m/2, 2 + m/2, c
^2*x^2])/(2 + m) - (4*d^2*((2 + m)*(-3 + c^2*x^2 + m*(-1 + c^2*x^2))*(a + b
*ArcSin[c*x]) + b*c*(1 + m)*x*Hypergeometric2F1[-1/2, 1 + m/2, 2 + m/2, c^2
*x^2] + 2*b*c*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2]))/((1 + m
)*(2 + m)*(3 + m))))/(5 + m)))/(7 + m)
```

Maple [F] time = 8.282, size = 0, normalized size = 0.

$$\int x^m\left(-c^2dx^2+d\right)^3(a+b\arcsin(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(ac^6d^3x^6-3\,ac^4d^3x^4+3\,ac^2d^3x^2-ad^3+\left(bc^6d^3x^6-3\,bc^4d^3x^4+3\,bc^2d^3x^2-bd^3\right)\arcsin\left(cx\right)\right)x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))*x^m, x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\left(c^2dx^2-d\right)^3\left(b\arcsin\left(cx\right)+a\right)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)*x^m, x)
```

3.144 $\int x^m \left(d-c^2 d x^2\right)^2 \left(a+b \sin^{-1}(cx)\right)\, dx$

Optimal. Leaf size=217

$$-\frac{bcd^2\left(15m^2+100m+149\right)x^{m+2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{(m+1)(m+2)(m+3)^2(m+5)^2}-\frac{2c^2d^2x^{m+3}\left(a+b\sin^{-1}(cx)\right)}{m+3}+\frac{c^4d^2x^{m+\cdots}}{}$$

```
[Out] -((b*c*d^2*(38 + 13*m + m^2)*x^(2 + m)*Sqrt[1 - c^2*x^2])/((3 + m)^2*(5 + m
)^2)) + (b*c^3*d^2*x^(4 + m)*Sqrt[1 - c^2*x^2])/(5 + m)^2 + (d^2*x^(1 + m)*
(a + b*ArcSin[c*x]))/(1 + m) - (2*c^2*d^2*x^(3 + m)*(a + b*ArcSin[c*x]))/(3
 + m) + (c^4*d^2*x^(5 + m)*(a + b*ArcSin[c*x]))/(5 + m) - (b*c*d^2*(149 + 1
00*m + 15*m^2)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x
^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2)
```

Rubi [A] time = 0.30633, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {270, 4687, 12, 1267, 459, 364}

$$-\frac{2c^2d^2x^{m+3}\left(a+b\sin^{-1}(cx)\right)}{m+3}+\frac{c^4d^2x^{m+5}\left(a+b\sin^{-1}(cx)\right)}{m+5}+\frac{d^2x^{m+1}\left(a+b\sin^{-1}(cx)\right)}{m+1}-\frac{bcd^2\left(15m^2+100m+149\right)\cdots}{(m+1)(m+2)(\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d^2*(38 + 13*m + m^2)*x^(2 + m)*Sqrt[1 - c^2*x^2])/((3 + m)^2*(5 + m
)^2)) + (b*c^3*d^2*x^(4 + m)*Sqrt[1 - c^2*x^2])/(5 + m)^2 + (d^2*x^(1 + m)*
(a + b*ArcSin[c*x]))/(1 + m) - (2*c^2*d^2*x^(3 + m)*(a + b*ArcSin[c*x]))/(3
 + m) + (c^4*d^2*x^(5 + m)*(a + b*ArcSin[c*x]))/(5 + m) - (b*c*d^2*(149 + 1
00*m + 15*m^2)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x
^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2)
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1267

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[(c^p*(f*x)^(m + 4*p - 1)*(d + e*x^2)^
```

```
(q + 1))/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1)), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx = \frac{d^2x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m} - \frac{2c^2d^2x^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m} + \frac{c^4d^2x^{5+m}\left(a+b\sin^{-1}\right.}{5+m}$$

$$= \frac{d^2x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m} - \frac{2c^2d^2x^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m} + \frac{c^4d^2x^{5+m}\left(a+b\sin^{-1}\right.}{5+m}$$

$$= \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2} + \frac{d^2x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m} - \frac{2c^2d^2x^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m}$$

$$= -\frac{bcd^2\left(38+13m+m^2\right)x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2} + \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2} + \frac{d^2x^{1+m}\left(a+b\right.}{1+}$$

$$= -\frac{bcd^2\left(38+13m+m^2\right)x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2} + \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2} + \frac{d^2x^{1+m}\left(a+b\right.}{1+}$$

Mathematica [A] time = 0.015439, size = 187, normalized size = 0.86

$$\frac{x^{m+1}\left(-\frac{4d^2\left(bc(m+1)x\text{Hypergeometric2F1}\left(-\frac{1}{2},\frac{m}{2}+1,\frac{m}{2}+2,c^2x^2\right)+2bcx\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2}+1,\frac{m}{2}+2,c^2x^2\right)+(m+2)\left(m\left(c^2x^2-1\right)+c^2x^2-3\right)\left(a+b\sin^{-1}(cx\right.\right.}{(m+1)(m+2)(m+3)}\right.}{m+5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]) - (b*c*d^2*x*Hypergeometr
ic2F1[-3/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2 + m) - (4*d^2*((2 + m)*(-3 + c^2
*x^2 + m*(-1 + c^2*x^2))*(a + b*ArcSin[c*x]) + b*c*(1 + m)*x*Hypergeometric
2F1[-1/2, 1 + m/2, 2 + m/2, c^2*x^2] + 2*b*c*x*Hypergeometric2F1[1/2, 1 + m
/2, 2 + m/2, c^2*x^2]))/((1 + m)*(2 + m)*(3 + m))))/(5 + m)
```

Maple [F] time = 5.034, size = 0, normalized size = 0.

$$\int x^m \left(-c^2 d x^2 + d\right)^2 (a + b \arcsin(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^4 d^2 x^4 - 2\, ac^2 d^2 x^2 + ad^2 + \left(bc^4 d^2 x^4 - 2\, bc^2 d^2 x^2 + bd^2\right) \arcsin(cx)\right) x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(c^2 d x^2 - d\right)^2 (b \arcsin(cx) + a) x^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)*x^m, x)
```

3.145 $\int x^m \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)dx$

Optimal. Leaf size=129

$$-\frac{bcd(3m+7)x^{m+2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{(m+1)(m+2)(m+3)^2}-\frac{c^2dx^{m+3}\left(a+b\sin^{-1}(cx)\right)}{m+3}+\frac{dx^{m+1}\left(a+b\sin^{-1}(cx)\right)}{m+1}-$$

```
[Out] -((b*c*d*x^(2 + m)*Sqrt[1 - c^2*x^2])/(3 + m)^2) + (d*x^(1 + m)*(a + b*ArcS
in[c*x]))/(1 + m) - (c^2*d*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) - (b*c*d*
(7 + 3*m)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/
((1 + m)*(2 + m)*(3 + m)^2)
```

Rubi [A] time = 0.141078, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {14, 4687, 12, 459, 364}

$$-\frac{c^2dx^{m+3}\left(a+b\sin^{-1}(cx)\right)}{m+3}+\frac{dx^{m+1}\left(a+b\sin^{-1}(cx)\right)}{m+1}-\frac{bcd(3m+7)x^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{(m+1)(m+2)(m+3)^2}-\frac{bcd\sqrt{1-c^2x^2}x^{m+}}{(m+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d*x^(2 + m)*Sqrt[1 - c^2*x^2])/(3 + m)^2) + (d*x^(1 + m)*(a + b*ArcS
in[c*x]))/(1 + m) - (c^2*d*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) - (b*c*d*
(7 + 3*m)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/
((1 + m)*(2 + m)*(3 + m)^2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int x^m\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)dx=\frac{dx^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m}-\frac{c^2dx^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m}-(bc)\int\frac{dx^{1+m}\left(\frac{1}{1+m}-\frac{c^2x^2}{3+m}\right)}{\sqrt{1-c^2x^2}}$$

$$=\frac{dx^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m}-\frac{c^2dx^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m}-(bcd)\int\frac{x^{1+m}\left(\frac{1}{1+m}-\frac{c^2x^2}{3+m}\right)}{\sqrt{1-c^2x^2}}$$

$$=-\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2}+\frac{dx^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m}-\frac{c^2dx^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m}-$$

$$=-\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2}+\frac{dx^{1+m}\left(a+b\sin^{-1}(cx)\right)}{1+m}-\frac{c^2dx^{3+m}\left(a+b\sin^{-1}(cx)\right)}{3+m}-$$

Mathematica [A] time = 0.0820227, size = 118, normalized size = 0.91

$$-\frac{dx^{m+1}\left(bc(m+1)x\text{Hypergeometric2F1}\left(-\frac{1}{2},\frac{m}{2}+1,\frac{m}{2}+2,c^2x^2\right)+2bcx\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2}+1,\frac{m}{2}+2,c^2x^2\right)\right.}{(m+1)(m+2)(m+3)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((d*x^(1 + m)*((2 + m)*(-3 + c^2*x^2 + m*(-1 + c^2*x^2))*(a + b*ArcSin[c*x
]) + b*c*(1 + m)*x*Hypergeometric2F1[-1/2, 1 + m/2, 2 + m/2, c^2*x^2] + 2*b
*c*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2]))/((1 + m)*(2 + m)*(
3 + m)))
```

Maple [F] time = 2.898, size = 0, normalized size = 0.

$$\int x^m\left(-c^2dx^2+d\right)(a+b\arcsin(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(ac^2dx^2 - ad + \left(bc^2dx^2 - bd\right)\arcsin(cx)\right)x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*x^m, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int -ax^m\,dx + \int -bx^m\,\text{asin}(cx)\,dx + \int ac^2x^2x^m\,dx + \int bc^2x^2x^m\,\text{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] -d*(Integral(-a*x**m, x) + Integral(-b*x**m*asin(c*x), x) + Integral(a*c**2
*x**2*x**m, x) + Integral(b*c**2*x**2*x**m*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\left(c^2dx^2 - d\right)(b\arcsin(cx) + a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)*x^m, x)
```

3.146 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx$

Optimal. Leaf size=27

$$\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2},x\right)$$

```
[Out] Unintegrable[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x]
```

Rubi [A] time = 0.0644057, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x]
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx=\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx$$

Mathematica [A] time = 3.92389, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x]
```

Maple [A] time = 0.539, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\arcsin(cx)\right)}{-c^2dx^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{(b\arcsin(cx)+a)x^m}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(b\arcsin(cx)+a)x^m}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{ax^m}{c^2x^2-1}\,dx+\int \frac{bx^m\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**m/(c**2*x**2 - 1), x) + Integral(b*x**m*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx)+a)x^m}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

3.147 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=116

$$\frac{(1-m)\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2},x\right)}{2d}-\frac{bcx^{m+2}\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{2d^2(m+2)}+\frac{x^{m+1}\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}$$

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - (b*c*x^(2 + m)*Hype
rgeometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(2*d^2*(2 + m)) + ((1 -
m)*Unintegrable[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x])/(2*d)
```

Rubi [A] time = 0.155358, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - (b*c*x^(2 + m)*Hype
rgeometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(2*d^2*(2 + m)) + ((1 -
m)*Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x])/(2*d)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx &= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{(bc)\int \frac{x^{1+m}}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^2}+\frac{(1-m)\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx}{2d}\\
&= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{bcx^{2+m}\,{}_2F_1\left(\frac{3}{2},\frac{2+m}{2};\frac{4+m}{2};c^2x^2\right)}{2d^2(2+m)}+\frac{(1-m)\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2}\,dx}{2d}
\end{aligned}$$

Mathematica [A] time = 5.70051, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2, x]
```

Maple [A] time = 0.54, size = 0, normalized size = 0.

$$\int \frac{x^{m} \left(a+b \arcsin \left(c x\right)\right)}{\left(-c^{2} d \,x^{2}+d \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^{m}}{\left(c^{2}dx^{2} - d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(b \arcsin(cx) + a)x^{m}}{c^{4}d^{2}x^{4} - 2\,c^{2}d^{2}x^{2} + d^{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)*x^m/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{ax^{m}}{c^{4}x^{4}-2c^{2}x^{2}+1}\,dx + \int \frac{bx^{m}\operatorname{asin}(cx)}{c^{4}x^{4}-2c^{2}x^{2}+1}\,dx}{d^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**m/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**m*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^{m}}{\left(c^{2}dx^{2} - d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^2, x)
```

3.148 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=207

$$\frac{(1-m)(3-m)\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)}{d-c^2dx^2},x\right)}{8d^2}-\frac{bc(3-m)x^{m+2}\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{8d^3(m+2)}-\frac{bcx^{m+}}{}$$

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m
)*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (b*c*(3 - m)*x^(2 + m)*Hyper
geometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(8*d^3*(2 + m)) - (b*c*x^
(2 + m)*Hypergeometric2F1[5/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 +
m)) + ((1 - m)*(3 - m)*Unintegrable[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^
2), x])/(8*d^2)
```

Rubi [A] time = 0.248424, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m
)*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (b*c*(3 - m)*x^(2 + m)*Hyper
geometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(8*d^3*(2 + m)) - (b*c*x^
(2 + m)*Hypergeometric2F1[5/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 +
m)) + ((1 - m)*(3 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)
, x])/(8*d^2)
```

Rubi steps

$$\begin{aligned}\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx &= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}-\frac{(bc)\int \frac{x^{1+m}}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4d^3}+\frac{(3-m)\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx}{4d}\\ &= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{(3-m)x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}-\frac{bcx^{2+m}\,{}_2F_1\left(\frac{5}{2},\frac{2+m}{2};\frac{4+m}{2};c^2x^2\right)}{4d^3(2+m)}\\ &= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{4d^3\left(1-c^2x^2\right)^2}+\frac{(3-m)x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{8d^3\left(1-c^2x^2\right)}-\frac{bc(3-m)x^{2+m}\,{}_2F_1\left(\frac{3}{2},\frac{2+m}{2};\frac{4+}{2}\right.}{8d^3(2+m)}\end{aligned}$$

Mathematica [A] time = 6.1133, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3, x]
```

Maple [A] time = 0.606, size = 0, normalized size = 0.

$$\int \frac{x^m (a + b \arcsin(cx))}{\left(-c^2 d x^2 + d\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{(b \arcsin(cx) + a)x^m}{\left(c^2 d x^2 - d\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^3, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(b \arcsin(cx) + a)x^m}{c^6 d^3 x^6 - 3\,c^4 d^3 x^4 + 3\,c^2 d^3 x^2 - d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)*x^m/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*
x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)x^m}{\left(c^2dx^2 - d\right)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^3, x)
```

3.149 $\int x^m \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=635

$$-\frac{15bcd^2x^{m+2}\sqrt{d-c^2dx^2}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)}{(m+1)(m+2)^2(m+4)(m+6)\sqrt{1-c^2x^2}}+\frac{15d^2x^{m+1}\sqrt{d-c^2dx^2}\text{Hyper}}{(m+6)}$$

```
[Out] (-15*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2]) - (5*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((6 + m)*(8 + 6*
m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((12
+ 8*m + m^2)*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^2*d*x^2
])/((4 + m)^2*(6 + m)*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d^2*x^(4 + m)*Sqrt[d -
c^2*d*x^2])/((4 + m)*(6 + m)*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^(6 + m)*Sqrt
[d - c^2*d*x^2])/((6 + m)^2*Sqrt[1 - c^2*x^2]) + (15*d^2*x^(1 + m)*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x]))/((6 + m)*(8 + 6*m + m^2)) + (5*d*x^(1 + m)
*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((4 + m)*(6 + m)) + (x^(1 + m)*
(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(6 + m) + (15*d^2*x^(1 + m)*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 +
m)/2, c^2*x^2])/((6 + m)*(8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (15*
b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2])
```

Rubi [A] time = 0.558513, antiderivative size = 635, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4699, 4697, 4711, 30, 14, 270}

$$-\frac{15bcd^2x^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2(m+4)(m+6)\sqrt{1-c^2x^2}}+\frac{15d^2x^{m+1}\sqrt{d-c^2dx^2}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)\left(a+b\,\text{s}\right.}{(m+6)\left(m^3+7m^2+14m+8\right)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (-15*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2]) - (5*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((6 + m)*(8 + 6*
m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((12
+ 8*m + m^2)*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^2*d*x^2
])/((4 + m)^2*(6 + m)*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d^2*x^(4 + m)*Sqrt[d -
c^2*d*x^2])/((4 + m)*(6 + m)*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^(6 + m)*Sqrt
[d - c^2*d*x^2])/((6 + m)^2*Sqrt[1 - c^2*x^2]) + (15*d^2*x^(1 + m)*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x]))/((6 + m)*(8 + 6*m + m^2)) + (5*d*x^(1 + m)
*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((4 + m)*(6 + m)) + (x^(1 + m)*
(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(6 + m) + (15*d^2*x^(1 + m)*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 +
m)/2, c^2*x^2])/((6 + m)*(8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (15*
b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2])
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
```

```
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) dx = \frac{x^{1+m}\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{6+m} + \frac{(5d)\int x^m\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.}{6+m}$$

$$= \frac{5dx^{1+m}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(4+m)(6+m)} + \frac{x^{1+m}\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx\right.}{6+m}$$

$$= -\frac{bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{\left(12+8m+m^2\right)\sqrt{1-c^2x^2}} + \frac{2bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}}{(4+m)(6+m)\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{6+m}\sqrt{d-c^2}}{(6+m)^2\sqrt{1-c^2}}$$

$$= -\frac{15bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}} - \frac{5bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}} - \frac{}{(12}$$

Mathematica [A] time = 1.31565, size = 338, normalized size = 0.53

$$\frac{d^2x^{m+1}\sqrt{d-c^2dx^2}\left(-5(m+6)\left(3(m+4)\left(bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)-(m+2\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(-(b*c*(1 + m)*(2 + m)*(4 + m)*x*((4 + m
)*(6 + m) - 2*c^2*(2 + m)*(6 + m)*x^2 + c^4*(2 + m)*(4 + m)*x^4)) + (1 + m)
*(2 + m)^2*(4 + m)^2*(6 + m)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]) - 5*(6
 + m)*(b*c*(1 + m)*(2 + m)*x*(4 + m - c^2*(2 + m)*x^2) - (1 + m)*(2 + m)^2*
(4 + m)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]) + 3*(4 + m)*(b*c*(1 + m)*x
- (1 + m)*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (2 + m)*(a + b*Ar
cSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] + b*c*x*Hy
pergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))))/(
(1 + m)*(2 + m)^2*(4 + m)^2*(6 + m)^2*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 4.455, size = 0, normalized size = 0.

$$\int x^m \left(-c^2dx^2+d\right)^{\frac{5}{2}} (a+b\arcsin(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)x^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^4d^2x^4 - 2\,ac^2d^2x^2 + ad^2 + \left(bc^4d^2x^4 - 2\,bc^2d^2x^2 + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right) + a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^m, x)
```

3.150 $\int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=399

$$-\frac{3bcdx^{m+2}\sqrt{d-c^2dx^2}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)}{(m+1)(m+2)^2(m+4)\sqrt{1-c^2x^2}}+\frac{3dx^{m+1}\sqrt{d-c^2dx^2}\text{Hypergeo}}{(m^3+}$$

```
[Out] (-3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*Sqrt[1 - c^2*x^
2]) - (b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((8 + 6*m + m^2)*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^(4 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^2*Sqrt[1 - c^2*x^2]
) + (3*d*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8 + 6*m + m^2)
 + (x^(1 + m)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4 + m) + (3*d*x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 +
m)/2, (3 + m)/2, c^2*x^2])/((8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (
3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*Sqrt[1 - c^2
*x^2])
```

Rubi [A] time = 0.332184, antiderivative size = 399, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4699, 4697, 4711, 30, 14}

$$-\frac{3bcdx^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2(m+4)\sqrt{1-c^2x^2}}+\frac{3dx^{m+1}\sqrt{d-c^2dx^2}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)\left(a+b\sin^{-1}\right.}{\left(m^3+7m^2+14m+8\right)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*Sqrt[1 - c^2*x^
2]) - (b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((8 + 6*m + m^2)*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^(4 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^2*Sqrt[1 - c^2*x^2]
) + (3*d*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8 + 6*m + m^2)
 + (x^(1 + m)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4 + m) + (3*d*x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 +
m)/2, (3 + m)/2, c^2*x^2])/((8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (
3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*Sqrt[1 - c^2
*x^2])
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
```

```
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)dx = \frac{x^{1+m}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{4+m} + \frac{(3d)\int x^m\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.}{4+m}$$

$$= \frac{3dx^{1+m}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8+6m+m^2} + \frac{x^{1+m}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{4+m}$$

$$= -\frac{3bcdx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)\sqrt{1-c^2x^2}} - \frac{bcdx^{2+m}\sqrt{d-c^2dx^2}}{\left(8+6m+m^2\right)\sqrt{1-c^2x^2}} + \frac{bc^3dx^{4+m}\sqrt{d-}}{(4+m)^2\sqrt{1-}}$$

Mathematica [A] time = 0.603898, size = 237, normalized size = 0.59

$$\frac{dx^{m+1}\sqrt{d-c^2dx^2}\left(-\frac{3\left(bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)-(m+2)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)\right.}{(m+1)(m+2)^2\sqrt{1-c^2x^2}}\right.}{m+4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(-((b*c*x*(4 + m - c^2*(2 + m)*x^2))/((2 +
 m)*(4 + m)*Sqrt[1 - c^2*x^2])) + (1 - c^2*x^2)*(a + b*ArcSin[c*x]) - (3*(b
*c*(1 + m)*x - (1 + m)*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (2 +
 m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^
2] + b*c*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c
^2*x^2]))/((1 + m)*(2 + m)^2*Sqrt[1 - c^2*x^2])))/(4 + m)
```

Maple [F] time = 2.572, size = 0, normalized size = 0.

$$\int x^{m} \left(-c^{2} d x^{2}+d\right)^{\frac{3}{2}} \left(a+b \arcsin \left(c x\right)\right)d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^{2} d x^{2}+d\right)^{\frac{3}{2}} (b \arcsin \left(c x\right) + a) x^{m} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\left(a c^{2} d x^{2}-a d+\left(b c^{2} d x^{2}-b d\right) \arcsin \left(c x\right)\right) \sqrt{-c^{2} d x^{2}+d} x^{m}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^{2} d x^{2}+d\right)^{\frac{3}{2}} (b \arcsin \left(c x\right) + a) x^{m} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^m, x)
```

3.151 $\int x^m \sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=245

$$-\frac{bcx^{m+2}\sqrt{d-c^2dx^2}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)}{(m+1)(m+2)^2\sqrt{1-c^2x^2}}+\frac{x^{m+1}\sqrt{d-c^2dx^2}\text{Hypergeomet}}{(m^2+}$$

```
[Out] -((b*c*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*Sqrt[1 - c^2*x^2])) + (x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2 + m) + (x^(1 + m)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*x^(2 + m)*Sqrt[d -
 c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2},
c^2*x^2])/((1 + m)*(2 + m)^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.202124, antiderivative size = 245, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4697, 4711, 30}

$$-\frac{bcx^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2\sqrt{1-c^2x^2}}+\frac{x^{m+1}\sqrt{d-c^2dx^2}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{\left(m^2+3m+2\right)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*Sqrt[1 - c^2*x^2])) + (x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2 + m) + (x^(1 + m)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*x^(2 + m)*Sqrt[d -
 c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2},
c^2*x^2])/((1 + m)*(2 + m)^2*Sqrt[1 - c^2*x^2])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int x^m\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx=\frac{x^{1+m}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2+m}+\frac{\sqrt{d-c^2dx^2}\int\frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}dx}{(2+m)\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d\right.}}{(2}$$

$$=-\frac{bcx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2+m}+\frac{x^{1+m}\sqrt{d-c^2dx^2}}{(}$$

Mathematica [A] time = 0.0733063, size = 181, normalized size = 0.74

$$\frac{x^{m+1}\sqrt{d-c^2dx^2}\left(-bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)+(m+2)\text{Hypergeometric}\right.}{(m+1)(m+2)^{2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*Sqrt[d - c^2*d*x^2]*((1 + m)*(-(b*c*x) + a*(2 + m)*Sqrt[1 - c^2*
x^2] + b*(2 + m)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]) + (2 + m)*(a + b*ArcSin[c*x
])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] - b*c*x*Hypergeome
tricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))/((1 + m)*(2
 + m)^2*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 1.957, size = 0, normalized size = 0.

$$\int x^m\sqrt{-c^2dx^2+d}\,(a+b\arcsin(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^m\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\text{asin}\,(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**m*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m, x)
```

3.152 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=163

$$\frac{\sqrt{1-c^2x^2}x^{m+1}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(m+1)\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}x^{m+2}\text{HypergeometricPFQ}}{\left(m^2+3m+\right.}$$

```
[Out] (x^(1 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1
+ m)/2, (3 + m)/2, c^2*x^2])/((1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)
*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.196726, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {4713, 4711}

$$\frac{\sqrt{1-c^2x^2}x^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(m+1)\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1
+ m)/2, (3 + m)/2, c^2*x^2])/((1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)
*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[d - c^2*d*x^2])
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{x^m \left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$
$$= \frac{x^{1+m}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right){}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2};c^2x^2\right)}{(1+m)\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,1+\frac{m}{2},1\right.}{\left(2+3m+m^2\right)\sqrt{}}$$

Mathematica [A] time = 0.0630509, size = 129, normalized size = 0.79

$$\frac{\sqrt{1-c^2x^2}x^{m+1}\left((m+2)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}\right.\right.\right.}{(m+1)(m+2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 - c^2*x^2]*((2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1
[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] - b*c*x*HypergeometricPFQ[{1, 1 + m/2,
 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))/((1 + m)*(2 + m)*Sqrt[d - c^2*d
*x^2])
```

Maple [F] time = 0.905, size = 0, normalized size = 0.

$$\int x^m\left(a+b\arcsin(cx)\right)\frac{1}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)x^m}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^m}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m (a + b \operatorname{asin}(cx))}{\sqrt{-d (cx - 1) (cx + 1)}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^m}{\sqrt{-c^2 dx^2 + d}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/sqrt(-c^2*d*x^2 + d), x)
```

3.153 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=272

$$\frac{bcm\sqrt{1-c^2x^2}x^{m+2}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)}{d\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}-\frac{m\sqrt{1-c^2x^2}x^{m+1}\text{Hypergeometr}}{d(m}$$

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) - (m*x^(1 + m)*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/(d*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2
*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d*(2 + m)*Sqrt[
d - c^2*d*x^2]) + (b*c*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1,
1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(d*(2 + 3*m + m^2)*Sqrt[
d - c^2*d*x^2])
```

Rubi [A] time = 0.314929, antiderivative size = 272, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4705, 4713, 4711, 364}

$$\frac{bcm\sqrt{1-c^2x^2}x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{d\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}-\frac{m\sqrt{1-c^2x^2}x^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{d(m+1)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```


```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) - (m*x^(1 + m)*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/(d*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2
*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d*(2 + m)*Sqrt[
d - c^2*d*x^2]) + (b*c*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1,
1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(d*(2 + 3*m + m^2)*Sqrt[
d - c^2*d*x^2])
```


Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
```

```
erQ[m] || EqQ[n, 1])
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}} - \frac{m\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx}{d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x^{1+m}}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\,{}_2F_1\left(1,\frac{2+m}{2};\frac{4+m}{2};c^2x^2\right)}{d(2+m)\sqrt{d-c^2dx^2}} - \frac{\left(m\sqrt{1-c^2x^2}\right)\int \frac{x^m(}{}}{d\sqrt{d-c^2}}$$

$$= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}} - \frac{mx^{1+m}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\,{}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2};c^2x^2\right)}{d(1+m)\sqrt{d-c^2dx^2}} - \frac{bc}{}$$

Mathematica [A] time = 0.24728, size = 207, normalized size = 0.76

$$\frac{x^{m+1}\left(bcmx\sqrt{1-c^2x^2}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)-m(m+2)\sqrt{1-c^2x^2}\text{Hyperg}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x^(1 + m)*(-(m*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometri
c2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2]) + (1 + m)*((2 + m)*(a + b*ArcSin[
c*x]) - b*c*x*Sqrt[1 - c^2*x^2]*Hypergeometric2F1[1, 1 + m/2, 2 + m/2, c^2*
x^2]) + b*c*m*x*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2},
{3/2 + m/2, 2 + m/2}, c^2*x^2]))/(d*(1 + m)*(2 + m)*Sqrt[d - c^2*d*x^2])
```

Maple [F] time = 0.575, size = 0, normalized size = 0.

$$\int x^m\left(a+b\arcsin(cx)\right)\left(-c^2dx^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^m}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)x^m}{c^4d^2x^4 - 2\,c^2d^2x^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^4*d^2*x^4 - 2*c^2*
d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m\,(a + b \operatorname{asin}(cx))}{(-d\,(cx - 1)\,(cx + 1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^m}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

3.154 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=408

$$\frac{bc(2-m)m\sqrt{1-c^2x^2}x^{m+2}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2\right\},c^2x^2\right)}{3d^2\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}-\frac{(2-m)m\sqrt{1-c^2x^2}x^{m}\cdots}{\cdots}$$

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + ((2 - m)*x^(1
 + m)*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) - ((2 - m)*m*x^(1 +
m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
(3 + m)/2, c^2*x^2])/(3*d^2*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*(2 - m)*x^(
2 + m)*Sqrt[1 - c^2*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2
])/(3*d^2*(2 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2*x^2]*H
ypergeometric2F1[2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(3*d^2*(2 + m)*Sqrt[d -
 c^2*d*x^2]) + (b*c*(2 - m)*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ
[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(3*d^2*(2 + 3*m + m
^2)*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.454834, antiderivative size = 408, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4705, 4713, 4711, 364}

$$\frac{bc(2-m)m\sqrt{1-c^2x^2}x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{3d^2\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}-\frac{(2-m)m\sqrt{1-c^2x^2}x^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)\cdots}{3d^2(m+1)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + ((2 - m)*x^(1
 + m)*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) - ((2 - m)*m*x^(1 +
m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
(3 + m)/2, c^2*x^2])/(3*d^2*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*(2 - m)*x^(
2 + m)*Sqrt[1 - c^2*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2
])/(3*d^2*(2 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2*x^2]*H
ypergeometric2F1[2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(3*d^2*(2 + m)*Sqrt[d -
 c^2*d*x^2]) + (b*c*(2 - m)*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ
[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(3*d^2*(2 + 3*m + m
^2)*Sqrt[d - c^2*d*x^2])
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{x^m \left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x^{1+m}}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\,{}_2F_1\left(2,\frac{2+m}{2};\frac{4+m}{2}\ldots\right.}{3d^2(2+m)\sqrt{d-c^2dx^2}}$$

$$= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(2-m)x^{2+m}\sqrt{1-c^2x^2}\,{}_2F_1\left(1,\frac{2}{}\ldots\right.}{3d^2(2+m)\sqrt{d-c^2d\ldots}}$$

$$= \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{(2-m)mx^{1+m}\sqrt{1-c^2x^2}\left(a+b\sin\ldots\right.}{3d^2(1+m)\ldots}$$

Mathematica [A] time = 0.380634, size = 279, normalized size = 0.68

$$\frac{x^{m+1}\left((2-m)\left(d-c^2dx^2\right)\left(-m\sqrt{1-c^2x^2}\left((m+2)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)-bcx\text{Hype}\ldots\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (x^(1 + m)*(d*(1 + m)*(2 + m)*(a + b*ArcSin[c*x]) - b*c*d*(1 + m)*x*(1 - c^
2*x^2)^(3/2)*Hypergeometric2F1[2, 1 + m/2, 2 + m/2, c^2*x^2] + (2 - m)*(d -
 c^2*d*x^2)*((1 + m)*(2 + m)*(a + b*ArcSin[c*x]) - b*c*(1 + m)*x*Sqrt[1 - c
^2*x^2]*Hypergeometric2F1[1, 1 + m/2, 2 + m/2, c^2*x^2] - m*Sqrt[1 - c^2*x^
2]*((2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2
```

```
, c^2*x^2] - b*c*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2]))))/(3*d^2*(1 + m)*(2 + m)*(d - c^2*d*x^2)^(3/2))
```

Maple [F] time = 0.602, size = 0, normalized size = 0.

$$\int x^{m} (a + b \arcsin (cx)) \left(-c^{2} d x^{2} + d\right)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin (cx) + a)x^{m}}{\left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{\sqrt{-c^{2} d x^{2} + d}(b \arcsin (cx) + a)x^{m}}{c^{6} d^{3} x^{6} - 3\, c^{4} d^{3} x^{4} + 3\, c^{2} d^{3} x^{2} - d^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^6*d^3*x^6 - 3*c^4
*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)x^m}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

3.155 $\int \frac{x^m \sin^{-1}(ax)}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=100

$$\frac{x^{m+1}\sin^{-1}(ax)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},a^2x^2\right)}{m+1}-\frac{ax^{m+2}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}+\frac{3}{2},\right.\right.}{m^2+3m+2}$$

```
[Out] (x^(1 + m)*ArcSin[a*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, a^2*x^2
])/(1 + m) - (a*x^(2 + m)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m
/2, 2 + m/2}, a^2*x^2])/(2 + 3*m + m^2)
```

Rubi [A] time = 0.0699534, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.045, Rules used = {4711}

$$\frac{x^{m+1}\sin^{-1}(ax)\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};a^2x^2\right)}{m+1}-\frac{ax^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;a^2x^2\right)}{m^2+3m+2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x^(1 + m)*ArcSin[a*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, a^2*x^2
])/(1 + m) - (a*x^(2 + m)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m
/2, 2 + m/2}, a^2*x^2])/(2 + 3*m + m^2)
```

Rule 4711

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2])/(Sqrt[d]*f*(m + 1)), x] - Simp[
(b*c*(f*x)^(m + 2)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/(Sqrt[d]*f^2*(m + 1)*(m + 2)), x] /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{x^m \sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx=\frac{x^{1+m}\sin^{-1}(ax)\,{}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2};a^2x^2\right)}{1+m}-\frac{ax^{2+m}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};a^2x^2\right)}{2+3m+m^2}$$

Mathematica [A] time = 0.036555, size = 95, normalized size = 0.95

$$\frac{x^{m+1}\left((m+2)\sin^{-1}(ax)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},a^2x^2\right)-ax\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+1,\frac{m}{2}+1\right\},\left\{\frac{m}{2}\right.\right.\right.}{(m+1)(m+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x^(1 + m)*((2 + m)*ArcSin[a*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2
, a^2*x^2] - a*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m
```

```
/2}, a^2*x^2]))/((1 + m)*(2 + m))
```

Maple [F] time = 0.513, size = 0, normalized size = 0.

$$\int x^{m} \arcsin(ax) \frac{1}{\sqrt{-a^{2}x^{2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m} \arcsin(ax)}{\sqrt{-a^{2}x^{2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arcsin(a*x)/sqrt(-a^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^{2}x^{2}+1}x^{m} \arcsin(ax)}{a^{2}x^{2}-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)/(a^2*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m} \operatorname{asin}(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \arcsin(ax)}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m*arcsin(a*x)/sqrt(-a^2*x^2 + 1), x)
```

3.156 $\int x^4 \left(d-c^2dx^2\right) \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=290

$$\frac{1}{7}dx^5\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{4bdx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{175c}+\frac{16bdx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{525c^3}+\frac{2bd\left(1-c^2\right.}{}$$

```
[Out] (-304*b^2*d*x)/(3675*c^4) - (152*b^2*d*x^3)/(11025*c^2) - (38*b^2*d*x^5)/61
25 + (2*b^2*c^2*d*x^7)/343 + (32*b*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/(525*c^5) + (16*b*d*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(525*c^3) +
 (4*b*d*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(21*c^5) - (4*b*d*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(35*c^5) + (2*b*d*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x])
)/(49*c^5) + (2*d*x^5*(a + b*ArcSin[c*x])^2)/35 + (d*x^5*(1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/7
```

Rubi [A] time = 0.461145, antiderivative size = 290, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4699, 4627, 4707, 4677, 8, 30, 266, 43, 4689, 12}

$$\frac{1}{7}dx^5\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{4bdx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{175c}+\frac{16bdx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{525c^3}+\frac{2bd\left(1-c^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-304*b^2*d*x)/(3675*c^4) - (152*b^2*d*x^3)/(11025*c^2) - (38*b^2*d*x^5)/61
25 + (2*b^2*c^2*d*x^7)/343 + (32*b*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/(525*c^5) + (16*b*d*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(525*c^3) +
 (4*b*d*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(21*c^5) - (4*b*d*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(35*c^5) + (2*b*d*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x])
)/(49*c^5) + (2*d*x^5*(a + b*ArcSin[c*x])^2)/35 + (d*x^5*(1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/7
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int x^4 \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{7}dx^5\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{7}(2d)\int x^4\left(a+b\sin^{-1}(cx)\right)^2 dx-\frac{1}{7}(2bcd$$

$$= \frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{21c^5}-\frac{4bd\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{35c^5}+\frac{2bd\,(}{}$$

$$= \frac{4bdx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{175c}+\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{21c^5}-\frac{4bd\,(1}{}$$

$$= -\frac{16b^2dx}{735c^4}-\frac{8b^2dx^3}{2205c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{16bdx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{525c^3}$$

$$= -\frac{16b^2dx}{735c^4}-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{32bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{525c^5}$$

$$= -\frac{304b^2dx}{3675c^4}-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{32bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\right.}{525c^5}$$

Mathematica [A] time = 0.265399, size = 203, normalized size = 0.7

$$-\frac{d\left(11025a^2c^5x^5\left(5c^2x^2-7\right)+210ab\sqrt{1-c^2x^2}\left(75c^6x^6-57c^4x^4-76c^2x^2-152\right)+210b\sin^{-1}(cx)\left(105ac^5x^5\left(5c^2x^2-7\right)\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d*(11025*a^2*c^5*x^5*(-7 + 5*c^2*x^2) + 210*a*b*Sqrt[1 - c^2*x^2]*(-152 -
 76*c^2*x^2 - 57*c^4*x^4 + 75*c^6*x^6) + b^2*(31920*c*x + 5320*c^3*x^3 + 23
94*c^5*x^5 - 2250*c^7*x^7) + 210*b*(105*a*c^5*x^5*(-7 + 5*c^2*x^2) + b*Sqrt
[1 - c^2*x^2]*(-152 - 76*c^2*x^2 - 57*c^4*x^4 + 75*c^6*x^6))*ArcSin[c*x] +
11025*b^2*c^5*x^5*(-7 + 5*c^2*x^2)*ArcSin[c*x]^2))/(385875*c^5)
```

Maple [A] time = 0.111, size = 276, normalized size = 1.

$$\frac{1}{c^5}\left(-da^2\left(\frac{c^7x^7}{7}-\frac{c^5x^5}{5}\right)-db^2\left(-\frac{(\arcsin(cx))^2c^5x^5}{5}-\frac{2\arcsin(cx)\left(3c^4x^4+4c^2x^2+8\right)}{75}\sqrt{-c^2x^2+1}+\frac{38c^5x^5}{6125}+\frac{152c^3x}{11025}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^5*(-d*a^2*(1/7*c^7*x^7-1/5*c^5*x^5)-d*b^2*(-1/5*arcsin(c*x)^2*c^5*x^5-2
/75*arcsin(c*x)*(3*c^4*x^4+4*c^2*x^2+8)*(-c^2*x^2+1)^(1/2)+38/6125*c^5*x^5+
152/11025*c^3*x^3+304/3675*c*x+1/7*arcsin(c*x)^2*c^7*x^7+2/245*arcsin(c*x)*
(5*c^6*x^6+6*c^4*x^4+8*c^2*x^2+16)*(-c^2*x^2+1)^(1/2)-2/343*c^7*x^7)-2*d*a*
b*(1/7*arcsin(c*x)*c^7*x^7-1/5*arcsin(c*x)*c^5*x^5+1/49*c^6*x^6*(-c^2*x^2+1
)^(1/2)-19/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)-76/3675*c^2*x^2*(-c^2*x^2+1)^(1/
2)-152/3675*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.68027, size = 612, normalized size = 2.11

$$-\frac{1}{7}b^2c^2dx^7\arcsin(cx)^2-\frac{1}{7}a^2c^2dx^7+\frac{1}{5}b^2dx^5\arcsin(cx)^2+\frac{1}{5}a^2dx^5-\frac{2}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*b^2*c^2*d*x^7*arcsin(c*x)^2 - 1/7*a^2*c^2*d*x^7 + 1/5*b^2*d*x^5*arcsin
(c*x)^2 + 1/5*a^2*d*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)
*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16
*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^2*d - 2/25725*(105*(5*sqrt(-c^2*x^2 + 1)*
x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*
sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2
*x^3 + 1680*x)/c^6)*b^2*c^2*d + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2
 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)
*a*b*d + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^
2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 +
 120*x)/c^4)*b^2*d
```

Fricas [A] time = 1.89549, size = 559, normalized size = 1.93

$$-\frac{1125\left(49\,a^2-2\,b^2\right)c^7dx^7-63\left(1225\,a^2-38\,b^2\right)c^5dx^5+5320\,b^2c^3dx^3+31920\,b^2cdx+11025\left(5\,b^2c^7dx^7-7\,b^2c^5dx^5\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/385875*(1125*(49*a^2 - 2*b^2)*c^7*d*x^7 - 63*(1225*a^2 - 38*b^2)*c^5*d*x
^5 + 5320*b^2*c^3*d*x^3 + 31920*b^2*c*d*x + 11025*(5*b^2*c^7*d*x^7 - 7*b^2*
c^5*d*x^5)*arcsin(c*x)^2 + 22050*(5*a*b*c^7*d*x^7 - 7*a*b*c^5*d*x^5)*arcsin
(c*x) + 210*(75*a*b*c^6*d*x^6 - 57*a*b*c^4*d*x^4 - 76*a*b*c^2*d*x^2 - 152*a
*b*d + (75*b^2*c^6*d*x^6 - 57*b^2*c^4*d*x^4 - 76*b^2*c^2*d*x^2 - 152*b^2*d)
*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 17.71, size = 388, normalized size = 1.34

$$\begin{cases} -\frac{a^2c^2dx^7}{7}+\frac{a^2dx^5}{5}-\frac{2abc^2dx^7\operatorname{asin}(cx)}{7}-\frac{2abcdx^6\sqrt{-c^2x^2+1}}{49}+\frac{2abdx^5\operatorname{asin}(cx)}{5}+\frac{38abdx^4\sqrt{-c^2x^2+1}}{1225c}+\frac{152abdx^2\sqrt{-c^2x^2+1}}{3675c^3}+\frac{304abd\sqrt{-c^2x^2+}}{3675c^5} \\ \frac{a^2dx^5}{5} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**7/7 + a**2*d*x**5/5 - 2*a*b*c**2*d*x**7*asin(c*x
)/7 - 2*a*b*c*d*x**6*sqrt(-c**2*x**2 + 1)/49 + 2*a*b*d*x**5*asin(c*x)/5 + 3
8*a*b*d*x**4*sqrt(-c**2*x**2 + 1)/(1225*c) + 152*a*b*d*x**2*sqrt(-c**2*x**2
 + 1)/(3675*c**3) + 304*a*b*d*sqrt(-c**2*x**2 + 1)/(3675*c**5) - b**2*c**2*
d*x**7*asin(c*x)**2/7 + 2*b**2*c**2*d*x**7/343 - 2*b**2*c*d*x**6*sqrt(-c**2
*x**2 + 1)*asin(c*x)/49 + b**2*d*x**5*asin(c*x)**2/5 - 38*b**2*d*x**5/6125
+ 38*b**2*d*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(1225*c) - 152*b**2*d*x**3/
(11025*c**2) + 152*b**2*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3675*c**3) -
 304*b**2*d*x/(3675*c**4) + 304*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3675
*c**5), Ne(c, 0)), (a**2*d*x**5/5, True))
```

Giac [A] time = 1.46853, size = 668, normalized size = 2.3

$$-\frac{1}{7}a^2c^2dx^7+\frac{1}{5}a^2dx^5-\frac{\left(c^2x^2-1\right)^3b^2dx\arcsin\left(cx\right)^2}{7c^4}-\frac{2\left(c^2x^2-1\right)^3abdx\arcsin\left(cx\right)}{7c^4}-\frac{8\left(c^2x^2-1\right)^2b^2dx\arcsin\left(cx\right)^2}{35c^4}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/7*a^2*c^2*d*x^7 + 1/5*a^2*d*x^5 - 1/7*(c^2*x^2 - 1)^3*b^2*d*x*arcsin(c*x
)^2/c^4 - 2/7*(c^2*x^2 - 1)^3*a*b*d*x*arcsin(c*x)/c^4 - 8/35*(c^2*x^2 - 1)^
2*b^2*d*x*arcsin(c*x)^2/c^4 + 2/343*(c^2*x^2 - 1)^3*b^2*d*x/c^4 - 16/35*(c^
2*x^2 - 1)^2*a*b*d*x*arcsin(c*x)/c^4 - 1/35*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*
x)^2/c^4 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^5 +
484/42875*(c^2*x^2 - 1)^2*b^2*d*x/c^4 - 2/35*(c^2*x^2 - 1)*a*b*d*x*arcsin(c
*x)/c^4 + 2/35*b^2*d*x*arcsin(c*x)^2/c^4 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x
^2 + 1)*a*b*d/c^5 - 16/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(
c*x)/c^5 - 3358/385875*(c^2*x^2 - 1)*b^2*d*x/c^4 + 4/35*a*b*d*x*arcsin(c*x)
/c^4 - 16/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d/c^5 + 2/105*(-c^2*x^
2 + 1)^(3/2)*b^2*d*arcsin(c*x)/c^5 - 37384/385875*b^2*d*x/c^4 + 2/105*(-c^2
*x^2 + 1)^(3/2)*a*b*d/c^5 + 4/35*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^5 +
 4/35*sqrt(-c^2*x^2 + 1)*a*b*d/c^5
```

3.157 $\int x^3 (d-c^2dx^2) (a+b\sin^{-1}(cx))^2 \, dx$

Optimal. Leaf size=202

$$-\frac{1}{18}bcdx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}dx^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{bdx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{18c}+\frac{bdx\sqrt{}}{}$$

```
[Out] -(b^2*d*x^2)/(24*c^2) - (b^2*d*x^4)/72 + (b^2*c^2*d*x^6)/108 + (b*d*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(12*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(18*c) - (b*c*d*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/18 - (d*(a + b*ArcSin[c*x])^2)/(24*c^4) + (d*x^4*(a + b*ArcSin[c*x])^2)/1
2 + (d*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/6
```

Rubi [A] time = 0.537396, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {4699, 4627, 4707, 4641, 30, 4697}

$$-\frac{1}{18}bcdx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}dx^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{bdx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{18c}+\frac{bdx\sqrt{}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(b^2*d*x^2)/(24*c^2) - (b^2*d*x^4)/72 + (b^2*c^2*d*x^6)/108 + (b*d*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(12*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(18*c) - (b*c*d*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/18 - (d*(a + b*ArcSin[c*x])^2)/(24*c^4) + (d*x^4*(a + b*ArcSin[c*x])^2)/1
2 + (d*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/6
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

```
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{6}dx^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}d\int x^3\left(a+b\sin^{-1}(cx)\right)^2\,dx-\frac{1}{3}(bcd)\int$$
$$=-\frac{1}{18}bcdx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{12}dx^4\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{6}dx^4\left(1-c^2\right.$$
$$=\frac{1}{108}b^2c^2dx^6+\frac{bdx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{18c}-\frac{1}{18}bcdx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-}\right.$$
$$=-\frac{1}{72}b^2dx^4+\frac{1}{108}b^2c^2dx^6+\frac{bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{12c^3}+\frac{bdx^3\sqrt{1-c^2x^2}\left(a\right.}{18c}$$
$$=-\frac{b^2dx^2}{24c^2}-\frac{1}{72}b^2dx^4+\frac{1}{108}b^2c^2dx^6+\frac{bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{12c^3}+\frac{bdx^3\sqrt{1-}}{}$$

Mathematica [A] time = 0.161663, size = 192, normalized size = 0.95

$$-\frac{d\left(9a^2\left(4c^6x^6-6c^4x^4+1\right)+6abcx\sqrt{1-c^2x^2}\left(2c^4x^4-2c^2x^2-3\right)+6b\sin^{-1}(cx)\left(3a\left(4c^6x^6-6c^4x^4+1\right)+bcx\sqrt{1-c^2x^2}\right.\right.}{216c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d*(b^2*c^2*x^2*(9 + 3*c^2*x^2 - 2*c^4*x^4) + 6*a*b*c*x*Sqrt[1 - c^2*x^2]*
(-3 - 2*c^2*x^2 + 2*c^4*x^4) + 9*a^2*(1 - 6*c^4*x^4 + 4*c^6*x^6) + 6*b*(b*c
*x*Sqrt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 2*c^4*x^4) + 3*a*(1 - 6*c^4*x^4 + 4*
c^6*x^6))*ArcSin[c*x] + 9*b^2*(1 - 6*c^4*x^4 + 4*c^6*x^6)*ArcSin[c*x]^2))/(
216*c^4)
```

Maple [A] time = 0.044, size = 306, normalized size = 1.5

$$\frac{1}{c^4}\left(-da^2\left(\frac{c^6x^6}{6}-\frac{c^4x^4}{4}\right)-db^2\left(-\frac{(\arcsin(cx))^2c^4x^4}{4}+\frac{\arcsin(cx)}{16}\left(-2c^3x^3\sqrt{-c^2x^2+1}-3cx\sqrt{-c^2x^2+1}+3\arcsin(\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^4*(-d*a^2*(1/6*c^6*x^6-1/4*c^4*x^4)-d*b^2*(-1/4*arcsin(c*x)^2*c^4*x^4+1
/16*arcsin(c*x)*(-2*c^3*x^3*(-c^2*x^2+1)^(1/2)-3*c*x*(-c^2*x^2+1)^(1/2)+3*a
rcsin(c*x))-1/24*arcsin(c*x)^2+1/72*c^4*x^4+1/24*c^2*x^2+1/6*arcsin(c*x)^2*
c^6*x^6-1/144*arcsin(c*x)*(-8*c^5*x^5*(-c^2*x^2+1)^(1/2)-10*c^3*x^3*(-c^2*x
^2+1)^(1/2)-15*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-1/108*c^6*x^6)-2*d*a*
b*(1/6*arcsin(c*x)*c^6*x^6-1/4*c^4*x^4*arcsin(c*x)+1/36*c^5*x^5*(-c^2*x^2+1
)^(1/2)-1/36*c^3*x^3*(-c^2*x^2+1)^(1/2)-1/24*c*x*(-c^2*x^2+1)^(1/2)+1/24*ar
csin(c*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{6}a^2c^2dx^6+\frac{1}{4}a^2dx^4-\frac{1}{144}\left(48x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\arcsin}{\sqrt{c^2}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/6*a^2*c^2*d*x^6 + 1/4*a^2*d*x^4 - 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c
^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)
*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*a*b*c^2*d + 1/16*(8
*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c
^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*a*b*d - 1/12*(2*b^2*c^2*
d*x^6 - 3*b^2*d*x^4)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - integra
te(1/6*(2*b^2*c^3*d*x^6 - 3*b^2*c*d*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Fricas [A] time = 1.90308, size = 470, normalized size = 2.33

$$-\frac{2\left(18a^2-b^2\right)c^6dx^6-3\left(18a^2-b^2\right)c^4dx^4+9b^2c^2dx^2+9\left(4b^2c^6dx^6-6b^2c^4dx^4+b^2d\right)\arcsin(cx)^2+18\left(4abc^6dx^6\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/216*(2*(18*a^2 - b^2)*c^6*d*x^6 - 3*(18*a^2 - b^2)*c^4*d*x^4 + 9*b^2*c^2
*d*x^2 + 9*(4*b^2*c^6*d*x^6 - 6*b^2*c^4*d*x^4 + b^2*d)*arcsin(c*x)^2 + 18*(
4*a*b*c^6*d*x^6 - 6*a*b*c^4*d*x^4 + a*b*d)*arcsin(c*x) + 6*(2*a*b*c^5*d*x^5
 - 2*a*b*c^3*d*x^3 - 3*a*b*c*d*x + (2*b^2*c^5*d*x^5 - 2*b^2*c^3*d*x^3 - 3*b
^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A] time = 12.1833, size = 332, normalized size = 1.64

$$\begin{cases} -\frac{a^2c^2dx^6}{6} + \frac{a^2dx^4}{4} - \frac{abc^2dx^6\operatorname{asin}(cx)}{3} - \frac{abcdx^5\sqrt{-c^2x^2+1}}{18} + \frac{abdx^4\operatorname{asin}(cx)}{2} + \frac{abdx^3\sqrt{-c^2x^2+1}}{18c} + \frac{abdx\sqrt{-c^2x^2+1}}{12c^3} - \frac{abd\operatorname{asin}(cx)}{12c^4} - \frac{b^2c^2dx^6\operatorname{asin}^2(\\ \frac{a^2dx^4}{4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**6/6 + a**2*d*x**4/4 - a*b*c**2*d*x**6*asin(c*x)/
3 - a*b*c*d*x**5*sqrt(-c**2*x**2 + 1)/18 + a*b*d*x**4*asin(c*x)/2 + a*b*d*x
**3*sqrt(-c**2*x**2 + 1)/(18*c) + a*b*d*x*sqrt(-c**2*x**2 + 1)/(12*c**3) -
a*b*d*asin(c*x)/(12*c**4) - b**2*c**2*d*x**6*asin(c*x)**2/6 + b**2*c**2*d*x
**6/108 - b**2*c*d*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/18 + b**2*d*x**4*asi
n(c*x)**2/4 - b**2*d*x**4/72 + b**2*d*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
18*c) - b**2*d*x**2/(24*c**2) + b**2*d*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(12
*c**3) - b**2*d*asin(c*x)**2/(24*c**4), Ne(c, 0)), (a**2*d*x**4/4, True))
```

Giac [B] time = 1.37161, size = 535, normalized size = 2.65

$$-\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}b^2dx\arcsin(cx)}{18c^3} - \frac{\left(c^2x^2-1\right)^3b^2d\arcsin(cx)^2}{6c^4} - \frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}abdx}{18c^3} + \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2d}{18c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*x*arcsin(c*x)/c^3 - 1/6*(c^2
*x^2 - 1)^3*b^2*d*arcsin(c*x)^2/c^4 - 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 +
1)*a*b*d*x/c^3 + 1/18*(-c^2*x^2 + 1)^(3/2)*b^2*d*x*arcsin(c*x)/c^3 - 1/3*(c
^2*x^2 - 1)^3*a*b*d*arcsin(c*x)/c^4 - 1/4*(c^2*x^2 - 1)^2*b^2*d*arcsin(c*x)
^2/c^4 + 1/18*(-c^2*x^2 + 1)^(3/2)*a*b*d*x/c^3 + 1/12*sqrt(-c^2*x^2 + 1)*b^
2*d*x*arcsin(c*x)/c^3 - 1/6*(c^2*x^2 - 1)^3*a^2*d/c^4 + 1/108*(c^2*x^2 - 1)
^3*b^2*d/c^4 - 1/2*(c^2*x^2 - 1)^2*a*b*d*arcsin(c*x)/c^4 + 1/12*sqrt(-c^2*x
^2 + 1)*a*b*d*x/c^3 - 1/4*(c^2*x^2 - 1)^2*a^2*d/c^4 + 1/72*(c^2*x^2 - 1)^2*
b^2*d/c^4 + 1/24*b^2*d*arcsin(c*x)^2/c^4 - 1/24*(c^2*x^2 - 1)*b^2*d/c^4 + 1
/12*a*b*d*arcsin(c*x)/c^4 - 5/216*b^2*d/c^4
```

3.158 $\int x^2 \left(d-c^2dx^2\right) \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=211

$$\frac{1}{5}dx^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{4bdx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{45c}-\frac{2bd\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{25c^3}+\frac{2bd\left(1-\right.}{}$$

```
[Out] (-52*b^2*d*x)/(225*c^2) - (26*b^2*d*x^3)/675 + (2*b^2*c^2*d*x^5)/125 + (8*b
*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3) + (4*b*d*x^2*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x]))/(15*c^3) - (2*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(25*c^
3) + (2*d*x^3*(a + b*ArcSin[c*x])^2)/15 + (d*x^3*(1 - c^2*x^2)*(a + b*ArcSi
n[c*x])^2)/5
```

Rubi [A] time = 0.33748, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4699, 4627, 4707, 4677, 8, 30, 266, 43, 4689, 12}

$$\frac{1}{5}dx^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{4bdx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{45c}-\frac{2bd\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{25c^3}+\frac{2bd\left(1-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-52*b^2*d*x)/(225*c^2) - (26*b^2*d*x^3)/675 + (2*b^2*c^2*d*x^5)/125 + (8*b
*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3) + (4*b*d*x^2*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x]))/(15*c^3) - (2*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(25*c^
3) + (2*d*x^3*(a + b*ArcSin[c*x])^2)/15 + (d*x^3*(1 - c^2*x^2)*(a + b*ArcSi
n[c*x])^2)/5
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
```

```
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int x^2 \left(d - c^2dx^2\right)\left(a + b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{5}dx^3\left(1 - c^2x^2\right)\left(a + b\sin^{-1}(cx)\right)^2 + \frac{1}{5}(2d)\int x^2\left(a + b\sin^{-1}(cx)\right)^2\,dx - \frac{1}{5}(2$$

$$= \frac{2bd\left(1 - c^2x^2\right)^{3/2}\left(a + b\sin^{-1}(cx)\right)}{15c^3} - \frac{2bd\left(1 - c^2x^2\right)^{5/2}\left(a + b\sin^{-1}(cx)\right)}{25c^3} + \frac{2}{15}$$

$$= \frac{4bdx^2\sqrt{1 - c^2x^2}\left(a + b\sin^{-1}(cx)\right)}{45c} + \frac{2bd\left(1 - c^2x^2\right)^{3/2}\left(a + b\sin^{-1}(cx)\right)}{15c^3} - \frac{2b}{}$$

$$= -\frac{4b^2dx}{75c^2} - \frac{26}{675}b^2dx^3 + \frac{2}{125}b^2c^2dx^5 + \frac{8bd\sqrt{1 - c^2x^2}\left(a + b\sin^{-1}(cx)\right)}{45c^3} + \frac{4bd}{}$$

$$= -\frac{52b^2dx}{225c^2} - \frac{26}{675}b^2dx^3 + \frac{2}{125}b^2c^2dx^5 + \frac{8bd\sqrt{1 - c^2x^2}\left(a + b\sin^{-1}(cx)\right)}{45c^3} + \frac{4b}{}$$

Mathematica [A] time = 0.21888, size = 179, normalized size = 0.85

$$-\frac{d\left(225a^2c^3x^3\left(3c^2x^2 - 5\right) + 30ab\sqrt{1 - c^2x^2}\left(9c^4x^4 - 13c^2x^2 - 26\right) + 30b\sin^{-1}(cx)\left(15ac^3x^3\left(3c^2x^2 - 5\right) + b\sqrt{1 - c^2x^2}\right.\right.}{3375c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d*(225*a^2*c^3*x^3*(-5 + 3*c^2*x^2) + 30*a*b*Sqrt[1 - c^2*x^2]*(-26 - 13*
c^2*x^2 + 9*c^4*x^4) + b^2*(780*c*x + 130*c^3*x^3 - 54*c^5*x^5) + 30*b*(15*
a*c^3*x^3*(-5 + 3*c^2*x^2) + b*Sqrt[1 - c^2*x^2]*(-26 - 13*c^2*x^2 + 9*c^4*
x^4))*ArcSin[c*x] + 225*b^2*c^3*x^3*(-5 + 3*c^2*x^2)*ArcSin[c*x]^2))/(3375*
c^3)
```

Maple [A] time = 0.087, size = 280, normalized size = 1.3

$$\frac{1}{c^3}\left(-da^2\left(\frac{c^5x^5}{5} - \frac{c^3x^3}{3}\right) - db^2\left(\frac{(\arcsin(cx))^2\left(c^2x^2 - 3\right)cx}{3} + \frac{4cx}{15} - \frac{4\arcsin(cx)}{15}\sqrt{-c^2x^2 + 1} + \frac{2\left(c^2x^2 - 1\right)\arcsin(}{45}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^3*(-d*a^2*(1/5*c^5*x^5-1/3*c^3*x^3)-d*b^2*(1/3*arcsin(c*x)^2*(c^2*x^2-3
)*c*x+4/15*c*x-4/15*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/45*arcsin(c*x)*(c^2*x^
2-1)*(-c^2*x^2+1)^(1/2)-2/135*(c^2*x^2-3)*c*x+1/15*arcsin(c*x)^2*(3*c^4*x^4
-10*c^2*x^2+15)*c*x+2/25*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)-2/375
*(3*c^4*x^4-10*c^2*x^2+15)*c*x)-2*d*a*b*(1/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^
3*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-13/225*c^2*x^2*(-c^2*x^2+1)^(
1/2)-26/225*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.65787, size = 478, normalized size = 2.27

$$-\frac{1}{5}b^2c^2dx^5\arcsin(cx)^2 - \frac{1}{5}a^2c^2dx^5 + \frac{1}{3}b^2dx^3\arcsin(cx)^2 - \frac{2}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2 + 1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2 +}}{c^4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/5*b^2*c^2*d*x^5*arcsin(c*x)^2 - 1/5*a^2*c^2*d*x^5 + 1/3*b^2*d*x^3*arcsin
(c*x)^2 - 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt
(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*d - 2/1125*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^2*d + 1/3*a^2*d*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2*d
```

Fricas [A] time = 1.79953, size = 456, normalized size = 2.16

$$-\frac{27\left(25\,a^2-2\,b^2\right)c^5dx^5-5\left(225\,a^2-26\,b^2\right)c^3dx^3+780\,b^2cdx+225\left(3\,b^2c^5dx^5-5\,b^2c^3dx^3\right)\arcsin\left(cx\right)^2+450\left(3\,abc^5dx\right.}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/3375*(27*(25*a^2 - 2*b^2)*c^5*d*x^5 - 5*(225*a^2 - 26*b^2)*c^3*d*x^3 + 7
80*b^2*c*d*x + 225*(3*b^2*c^5*d*x^5 - 5*b^2*c^3*d*x^3)*arcsin(c*x)^2 + 450*
(3*a*b*c^5*d*x^5 - 5*a*b*c^3*d*x^3)*arcsin(c*x) + 30*(9*a*b*c^4*d*x^4 - 13*
a*b*c^2*d*x^2 - 26*a*b*d + (9*b^2*c^4*d*x^4 - 13*b^2*c^2*d*x^2 - 26*b^2*d)*
arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] time = 6.33685, size = 313, normalized size = 1.48

$$\begin{cases} -\frac{a^2c^2dx^5}{5}+\frac{a^2dx^3}{3}-\frac{2abc^2dx^5\operatorname{asin}(cx)}{5}-\frac{2abcdx^4\sqrt{-c^2x^2+1}}{25}+\frac{2abdx^3\operatorname{asin}(cx)}{3}+\frac{26abdx^2\sqrt{-c^2x^2+1}}{225c}+\frac{52abd\sqrt{-c^2x^2+1}}{225c^3}-\frac{b^2c^2dx^5\operatorname{asin}^2(cx)}{5}+\frac{2b}{} \\ \frac{a^2dx^3}{3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**5/5 + a**2*d*x**3/3 - 2*a*b*c**2*d*x**5*asin(c*x
)/5 - 2*a*b*c*d*x**4*sqrt(-c**2*x**2 + 1)/25 + 2*a*b*d*x**3*asin(c*x)/3 + 2
6*a*b*d*x**2*sqrt(-c**2*x**2 + 1)/(225*c) + 52*a*b*d*sqrt(-c**2*x**2 + 1)/(
225*c**3) - b**2*c**2*d*x**5*asin(c*x)**2/5 + 2*b**2*c**2*d*x**5/125 - 2*b*
*2*c*d*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/25 + b**2*d*x**3*asin(c*x)**2/3
- 26*b**2*d*x**3/675 + 26*b**2*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*c
) - 52*b**2*d*x/(225*c**2) + 52*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*
c**3), Ne(c, 0)), (a**2*d*x**3/3, True))
```

Giac [A] time = 1.51352, size = 481, normalized size = 2.28

$$-\frac{1}{5}\,a^2c^2dx^5+\frac{1}{3}\,a^2dx^3-\frac{\left(c^2x^2-1\right)^2b^2dx\arcsin\left(cx\right)^2}{5\,c^2}-\frac{2\left(c^2x^2-1\right)^2abdx\arcsin\left(cx\right)}{5\,c^2}-\frac{\left(c^2x^2-1\right)b^2dx\arcsin\left(cx\right)^2}{15\,c^2}+\frac{2\,(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/5*a^2*c^2*d*x^5 + 1/3*a^2*d*x^3 - 1/5*(c^2*x^2 - 1)^2*b^2*d*x*arcsin(c*x
)^2/c^2 - 2/5*(c^2*x^2 - 1)^2*a*b*d*x*arcsin(c*x)/c^2 - 1/15*(c^2*x^2 - 1)*
b^2*d*x*arcsin(c*x)^2/c^2 + 2/125*(c^2*x^2 - 1)^2*b^2*d*x/c^2 - 2/15*(c^2*x
^2 - 1)*a*b*d*x*arcsin(c*x)/c^2 + 2/15*b^2*d*x*arcsin(c*x)^2/c^2 - 2/25*(c^
2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^3 - 22/3375*(c^2*x^2 -
1)*b^2*d*x/c^2 + 4/15*a*b*d*x*arcsin(c*x)/c^2 - 2/25*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*a*b*d/c^3 + 2/45*(-c^2*x^2 + 1)^(3/2)*b^2*d*arcsin(c*x)/c^3 -
856/3375*b^2*d*x/c^2 + 2/45*(-c^2*x^2 + 1)^(3/2)*a*b*d/c^3 + 4/15*sqrt(-c^2
*x^2 + 1)*b^2*d*arcsin(c*x)/c^3 + 4/15*sqrt(-c^2*x^2 + 1)*a*b*d/c^3
```

3.159 $\int x\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=138

$$\frac{bdx\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8c}+\frac{3bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{16c}-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{4c^2}+\frac{3d\left(a+b\sin^{-1}\right.}{32c^2}$$

```
[Out] (-5*b^2*d*x^2)/32 + (b^2*c^2*d*x^4)/32 + (3*b*d*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(16*c) + (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*c
) + (3*d*(a + b*ArcSin[c*x])^2)/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/(4*c^2)
```

Rubi [A] time = 0.132724, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4677, 4649, 4647, 4641, 30, 14}

$$\frac{bdx\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8c}+\frac{3bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{16c}-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{4c^2}+\frac{3d\left(a+b\sin^{-1}\right.}{32c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-5*b^2*d*x^2)/32 + (b^2*c^2*d*x^4)/32 + (3*b*d*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(16*c) + (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*c
) + (3*d*(a + b*ArcSin[c*x])^2)/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/(4*c^2)
```


Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx=-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{4c^2}+\frac{(bd)\int\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx}{2c}$$

$$=\frac{bdx\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8c}-\frac{d\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{4c^2}-\frac{1}{8}\left(b^2d\right.$$

$$=\frac{3bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{16c}+\frac{bdx\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8c}-\frac{d\left(1\right.}{}$$

$$=-\frac{5}{32}b^2dx^2+\frac{1}{32}b^2c^2dx^4+\frac{3bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{16c}+\frac{bdx\left(1-c^2x^2\right)^{3}}{}$$

Mathematica [A] time = 0.288349, size = 157, normalized size = 1.14

$$-\frac{d\left(cx\left(8a^2cx\left(c^2x^2-2\right)+2ab\sqrt{1-c^2x^2}\left(2c^2x^2-5\right)+b^2cx\left(5-c^2x^2\right)\right)+2b\sin^{-1}(cx)\left(a\left(8c^4x^4-16c^2x^2+5\right)+bcx\right.}{32c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d*(c*x*(b^2*c*x*(5 - c^2*x^2) + 8*a^2*c*x*(-2 + c^2*x^2) + 2*a*b*Sqrt[1 -
 c^2*x^2]*(-5 + 2*c^2*x^2)) + 2*b*(b*c*x*Sqrt[1 - c^2*x^2]*(-5 + 2*c^2*x^2)
 + a*(5 - 16*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + b^2*(5 - 16*c^2*x^2 + 8*c^
4*x^4)*ArcSin[c*x]^2))/(32*c^2)
```

Maple [A] time = 0.078, size = 206, normalized size = 1.5

$$\frac{1}{c^2}\left(-da^2\left(\frac{c^4x^4}{4}-\frac{c^2x^2}{2}\right)-db^2\left(\frac{(\arcsin(cx))^2\left(c^2x^2-1\right)^2}{4}-\frac{\arcsin(cx)}{16}\left(-2\,c^3x^3\sqrt{-c^2x^2+1}+5\,cx\sqrt{-c^2x^2+1}+3\,\text{arc}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^2*(-d*a^2*(1/4*c^4*x^4-1/2*c^2*x^2)-d*b^2*(1/4*arcsin(c*x)^2*(c^2*x^2-1
)^2-1/16*arcsin(c*x)*(-2*c^3*x^3*(-c^2*x^2+1)^(1/2)+5*c*x*(-c^2*x^2+1)^(1/2
)+3*arcsin(c*x))+3/32*arcsin(c*x)^2-1/32*(c^2*x^2-1)^2+3/32*c^2*x^2-3/32)-2
*d*a*b*(1/4*c^4*x^4*arcsin(c*x)-1/2*c^2*x^2*arcsin(c*x)+1/16*c^3*x^3*(-c^2*
x^2+1)^(1/2)-5/32*c*x*(-c^2*x^2+1)^(1/2)+5/32*arcsin(c*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a^2c^2dx^4-\frac{1}{16}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^4}\right)c\right)abc^2d+\frac{1}{2}a^2dx^2+\frac{1}{2}\left(2x^2\text{ar}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*c^2*d*x^4 - 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^
2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))
*c)*a*b*c^2*d + 1/2*a^2*d*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
 1)*x/c^2 - arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^2)))*a*b*d - 1/4*(b^2*c^2*
d*x^4 - 2*b^2*d*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - integra
te(1/2*(b^2*c^3*d*x^4 - 2*b^2*c*d*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Fricas [A] time = 1.93991, size = 396, normalized size = 2.87

$$-\frac{\left(8a^2-b^2\right)c^4dx^4-\left(16a^2-5b^2\right)c^2dx^2+\left(8b^2c^4dx^4-16b^2c^2dx^2+5b^2d\right)\arcsin(cx)^2+2\left(8abc^4dx^4-16abc^2dx^2+5a\right.}{32c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/32*((8*a^2 - b^2)*c^4*d*x^4 - (16*a^2 - 5*b^2)*c^2*d*x^2 + (8*b^2*c^4*d*
x^4 - 16*b^2*c^2*d*x^2 + 5*b^2*d)*arcsin(c*x)^2 + 2*(8*a*b*c^4*d*x^4 - 16*a
*b*c^2*d*x^2 + 5*a*b*d)*arcsin(c*x) + 2*(2*a*b*c^3*d*x^3 - 5*a*b*c*d*x + (2
*b^2*c^3*d*x^3 - 5*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] time = 4.00265, size = 269, normalized size = 1.95

$$\begin{cases}-\frac{a^2c^2dx^4}{4}+\frac{a^2dx^2}{2}-\frac{abc^2dx^4\operatorname{asin}(cx)}{2}-\frac{abcdx^3\sqrt{-c^2x^2+1}}{8}+abdx^2\operatorname{asin}(cx)+\frac{5abdx\sqrt{-c^2x^2+1}}{16c}-\frac{5abd\operatorname{asin}(cx)}{16c^2}-\frac{b^2c^2dx^4\operatorname{asin}^2(cx)}{4}+\frac{b^2c^2dx}{32} \\ \frac{a^2dx^2}{2}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**4/4 + a**2*d*x**2/2 - a*b*c**2*d*x**4*asin(c*x)/
2 - a*b*c*d*x**3*sqrt(-c**2*x**2 + 1)/8 + a*b*d*x**2*asin(c*x) + 5*a*b*d*x*
sqrt(-c**2*x**2 + 1)/(16*c) - 5*a*b*d*asin(c*x)/(16*c**2) - b**2*c**2*d*x**
4*asin(c*x)**2/4 + b**2*c**2*d*x**4/32 - b**2*c*d*x**3*sqrt(-c**2*x**2 + 1)
```

```
*asin(c*x)/8 + b**2*d*x**2*asin(c*x)**2/2 - 5*b**2*d*x**2/32 + 5*b**2*d*x*s
qrt(-c**2*x**2 + 1)*asin(c*x)/(16*c) - 5*b**2*d*asin(c*x)**2/(32*c**2), Ne(
c, 0)), (a**2*d*x**2/2, True))
```

Giac [A] time = 1.45066, size = 321, normalized size = 2.33

$$\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2dx\arcsin\left(cx\right)}{8\,c}-\frac{\left(c^2x^2-1\right)^2b^2d\arcsin\left(cx\right)^2}{4\,c^2}+\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}abdx}{8\,c}+\frac{3\,\sqrt{-c^2x^2+1}b^2dx\arcsin\left(cx\right)}{16\,c}-\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*d*x*arcsin(c*x)/c - 1/4*(c^2*x^2 - 1)^2*b^2*d*
arcsin(c*x)^2/c^2 + 1/8*(-c^2*x^2 + 1)^(3/2)*a*b*d*x/c + 3/16*sqrt(-c^2*x^2
 + 1)*b^2*d*x*arcsin(c*x)/c - 1/2*(c^2*x^2 - 1)^2*a*b*d*arcsin(c*x)/c^2 + 3
/16*sqrt(-c^2*x^2 + 1)*a*b*d*x/c - 1/4*(c^2*x^2 - 1)^2*a^2*d/c^2 + 1/32*(c^
2*x^2 - 1)^2*b^2*d/c^2 + 3/32*b^2*d*arcsin(c*x)^2/c^2 - 3/32*(c^2*x^2 - 1)*
b^2*d/c^2 + 3/16*a*b*d*arcsin(c*x)/c^2 - 15/256*b^2*d/c^2
```

3.160 $\int \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=128

$$\frac{1}{3}dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{9c}+\frac{4bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{2}{3}dx\left(a+b\sin\right.$$

```
[Out] (-14*b^2*d*x)/9 + (2*b^2*c^2*d*x^3)/27 + (4*b*d*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(3*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(9*c) +
 (2*d*x*(a + b*ArcSin[c*x])^2)/3 + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/3
```

Rubi [A] time = 0.137281, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4649, 4619, 4677, 8}

$$\frac{1}{3}dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{9c}+\frac{4bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{2}{3}dx\left(a+b\sin\right.$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-14*b^2*d*x)/9 + (2*b^2*c^2*d*x^3)/27 + (4*b*d*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(3*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(9*c) +
 (2*d*x*(a + b*ArcSin[c*x])^2)/3 + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/3
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{3}dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}(2d)\int\left(a+b\sin^{-1}(cx)\right)^2\,dx-\frac{1}{3}(2bcd)\int$$
$$=\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{9c}+\frac{2}{3}dx\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}dx\left(1-c^2x^2\right)(\ldots$$
$$=-\frac{2}{9}b^2dx+\frac{2}{27}b^2c^2dx^3+\frac{4bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{2bd\left(1-c^2x^2\right)^{3/2}(a\ldots}{9c}$$
$$=-\frac{14}{9}b^2dx+\frac{2}{27}b^2c^2dx^3+\frac{4bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{2bd\left(1-c^2x^2\right)^{3/2}(a\ldots}{9c}$$

Mathematica [A] time = 0.203339, size = 137, normalized size = 1.07

$$-\frac{d\left(9a^2cx\left(c^2x^2-3\right)+6ab\sqrt{1-c^2x^2}\left(c^2x^2-7\right)+6b\sin^{-1}(cx)\left(3acx\left(c^2x^2-3\right)+b\sqrt{1-c^2x^2}\left(c^2x^2-7\right)\right)-2b^2cx\left(c^2x\ldots\right.\right.}{27c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d*(-2*b^2*c*x*(-21 + c^2*x^2) + 6*a*b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) +
9*a^2*c*x*(-3 + c^2*x^2) + 6*b*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*
x*(-3 + c^2*x^2))*ArcSin[c*x] + 9*b^2*c*x*(-3 + c^2*x^2)*ArcSin[c*x]^2))/(2
7*c)
```

Maple [A] time = 0.033, size = 173, normalized size = 1.4

$$\frac{1}{c}\left(-da^2\left(\frac{c^3x^3}{3}-cx\right)-db^2\left(\frac{(\arcsin(cx))^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{3}-\frac{4\arcsin(cx)}{3}\sqrt{-c^2x^2+1}+\frac{2\left(c^2x^2-1\right)\arcsin(cx)}{9}\ldots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(-d*a^2*(1/3*c^3*x^3-c*x)-d*b^2*(1/3*arcsin(c*x)^2*(c^2*x^2-3)*c*x+4/3*
c*x-4/3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/9*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)-2/27*(c^2*x^2-3)*c*x)-2*d*a*b*(1/3*c^3*x^3*arcsin(c*x)-c*x*arcsi
n(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-7/9*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.6771, size = 315, normalized size = 2.46

$$-\frac{1}{3}b^2c^2dx^3\arcsin(cx)^2-\frac{1}{3}a^2c^2dx^3-\frac{2}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abc^2d-\frac{2}{27}\left(3c\left(\frac{\sqrt{-c^2\ldots}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/3*b^2*c^2*d*x^3*arcsin(c*x)^2 - 1/3*a^2*c^2*d*x^3 - 2/9*(3*x^3*arcsin(c*
x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d -
 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c
*x) - (c^2*x^3 + 6*x)/c^2)*b^2*c^2*d + b^2*d*x*arcsin(c*x)^2 - 2*b^2*d*(x -
 sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*x + 2*(c*x*arcsin(c*x) + sqrt(-c
^2*x^2 + 1))*a*b*d/c
```

Fricas [A] time = 1.81685, size = 335, normalized size = 2.62

$$-\frac{\left(9\,a^2-2\,b^2\right)c^3dx^3-3\left(9\,a^2-14\,b^2\right)cdx+9\left(b^2c^3dx^3-3\,b^2cdx\right)\arcsin\left(cx\right)^2+18\left(abc^3dx^3-3\,abcdx\right)\arcsin\left(cx\right)+6\,(a}{27\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/27*((9*a^2 - 2*b^2)*c^3*d*x^3 - 3*(9*a^2 - 14*b^2)*c*d*x + 9*(b^2*c^3*d*
x^3 - 3*b^2*c*d*x)*arcsin(c*x)^2 + 18*(a*b*c^3*d*x^3 - 3*a*b*c*d*x)*arcsin(
c*x) + 6*(a*b*c^2*d*x^2 - 7*a*b*d + (b^2*c^2*d*x^2 - 7*b^2*d)*arcsin(c*x))*
sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] time = 1.74528, size = 224, normalized size = 1.75

$$\begin{cases} -\frac{a^2c^2dx^3}{3}+a^2dx-\frac{2abc^2dx^3\operatorname{asin}(cx)}{3}-\frac{2abcdx^2\sqrt{-c^2x^2+1}}{9}+2abdx\operatorname{asin}(cx)+\frac{14abd\sqrt{-c^2x^2+1}}{9c}-\frac{b^2c^2dx^3\operatorname{asin}^2(cx)}{3}+\frac{2b^2c^2dx^3}{27}-\frac{2b^2cdx^2}{} \\ a^2dx \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**3/3 + a**2*d*x - 2*a*b*c**2*d*x**3*asin(c*x)/3 -
 2*a*b*c*d*x**2*sqrt(-c**2*x**2 + 1)/9 + 2*a*b*d*x*asin(c*x) + 14*a*b*d*sqr
t(-c**2*x**2 + 1)/(9*c) - b**2*c**2*d*x**3*asin(c*x)**2/3 + 2*b**2*c**2*d*x
**3/27 - 2*b**2*c*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/9 + b**2*d*x*asin(c
*x)**2 - 14*b**2*d*x/9 + 14*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c), Ne
(c, 0)), (a**2*d*x, True))
```

Giac [A] time = 1.45402, size = 265, normalized size = 2.07

$$-\frac{1}{3}\,a^2c^2dx^3-\frac{1}{3}\left(c^2x^2-1\right)b^2dx\arcsin\left(cx\right)^2-\frac{2}{3}\left(c^2x^2-1\right)abdx\arcsin\left(cx\right)+\frac{2}{3}\,b^2dx\arcsin\left(cx\right)^2+\frac{2}{27}\left(c^2x^2-1\right)b^2dx+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/3*a^2*c^2*d*x^3 - 1/3*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*x)^2 - 2/3*(c^2*x^2
 - 1)*a*b*d*x*arcsin(c*x) + 2/3*b^2*d*x*arcsin(c*x)^2 + 2/27*(c^2*x^2 - 1)*
```

```
b^2*d*x + 4/3*a*b*d*x*arcsin(c*x) + 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*d*arcsin(c
*x)/c + a^2*d*x - 40/27*b^2*d*x + 2/9*(-c^2*x^2 + 1)^(3/2)*a*b*d/c + 4/3*sq
rt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c + 4/3*sqrt(-c^2*x^2 + 1)*a*b*d/c
```

3.161 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))^2}{x}\,dx$

Optimal. Leaf size=178

$$-ibd\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}b^2d\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2-\frac{1}{2}bcdx$$

```
[Out] (b^2*c^2*d*x^2)/4 - (b*c*d*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 - (d*
(a + b*ArcSin[c*x])^2)/4 + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 - ((I/
3)*d*(a + b*ArcSin[c*x])^3)/b + d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Ar
cSin[c*x])] - I*b*d*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] +
 (b^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rubi [A] time = 0.238255, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4699, 4625, 3717, 2190, 2531, 2282, 6589, 4647, 4641, 30}

$$-ibd\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}b^2d\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2-\frac{1}{2}bcdx$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (b^2*c^2*d*x^2)/4 - (b*c*d*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 - (d*
(a + b*ArcSin[c*x])^2)/4 + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 - ((I/
3)*d*(a + b*ArcSin[c*x])^3)/b + d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Ar
cSin[c*x])] - I*b*d*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] +
 (b^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)\left(a+b\sin^{-1}(cx)\right)^2}{x}dx = \frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2 + d\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x}dx - (bcd)\int \sqrt{1-c^2x^2}$$

$$= -\frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) + \frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2 + d\,\text{Subst}\Big($$

$$= \frac{1}{4}b^2c^2dx^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{2}d\big(1-c^2$$

$$= \frac{1}{4}b^2c^2dx^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{2}d\big(1-c^2$$

$$= \frac{1}{4}b^2c^2dx^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{2}d\big(1-c^2$$

$$= \frac{1}{4}b^2c^2dx^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{2}d\big(1-c^2$$

$$= \frac{1}{4}b^2c^2dx^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{2}d\big(1-c^2$$

Mathematica [A] time = 0.452689, size = 236, normalized size = 1.33

$$\frac{1}{2}d\left(-2iab\left(\sin^{-1}(cx)^2 + \text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right) + \frac{1}{12}b^2\left(24i\sin^{-1}(cx)\text{PolyLog}\left(2,e^{-2i\sin^{-1}(cx)}\right) + 12\text{PolyLog}\left(3,e^{-2i\sin\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d*(-(a^2*c^2*x^2) - 2*a*b*c^2*x^2*ArcSin[c*x] + a*b*(-(c*x*Sqrt[1 - c^2*x^
2]) + ArcSin[c*x]) + (b^2*(-1 + 2*ArcSin[c*x]^2)*Cos[2*ArcSin[c*x]])/4 + 4*
a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*a^2*Log[x] - (2*I)*a*b*(
ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])]) + (b^2*((-I)*Pi^3 + (8*I
)*ArcSin[c*x]^3 + 24*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + (24*I)
*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + 12*PolyLog[3, E^((-2*I)*A
rcSin[c*x])]))/12 - (b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/2))/2
```

Maple [B] time = 0.229, size = 459, normalized size = 2.6

$$-\frac{da^2c^2x^2}{2} + da^2\ln(cx) - 2\,idb^2\arcsin(cx)\,\text{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right) - \frac{db^2\arcsin(cx)\,cx}{2}\sqrt{-c^2x^2+1} - \frac{db^2(\arcsin}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] -1/2*d*a^2*c^2*x^2+d*a^2*ln(c*x)-2*I*d*b^2*arcsin(c*x)*polylog(2,-I*c*x-(-c
^2*x^2+1)^(1/2))-1/2*d*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-1/2*d*b^2*arc
sin(c*x)^2*c^2*x^2+1/4*d*b^2*arcsin(c*x)^2+1/4*b^2*c^2*d*x^2-1/8*d*b^2+d*b^
2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/3*I*d*b^2*arcsin(c*x)^3+2*
d*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+d*b^2*arcsin(c*x)^2*ln(1-I*c*x-(
-c^2*x^2+1)^(1/2))-2*I*d*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*d*b^2*po
lylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-2*I*d*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(
1/2))-1/2*d*a*b*(-c^2*x^2+1)^(1/2)*c*x-d*a*b*arcsin(c*x)*c^2*x^2+1/2*d*a*b*
arcsin(c*x)+2*d*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*d*a*b*arcs
```

```
in(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*d*b^2*arcsin(c*x)*polylog(2,I*c*
x+(-c^2*x^2+1)^(1/2))-I*d*a*b*arcsin(c*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}a^2c^2dx^2 + a^2d\log(x) - \int \frac{\left(b^2c^2dx^2 - b^2d\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)^2 + 2\left(abc^2dx^2 - abd\right)\arctan\left(cx, \sqrt{cx+\right.}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*c^2*d*x^2 + a^2*d*log(x) - integrate(((b^2*c^2*d*x^2 - b^2*d)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2c^2dx^2 - a^2d + \left(b^2c^2dx^2 - b^2d\right)\arcsin(cx)^2 + 2\left(abc^2dx^2 - abd\right)\arcsin(cx)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int -\frac{a^2}{x}\,dx + \int a^2c^2x\,dx + \int -\frac{b^2\operatorname{asin}^2(cx)}{x}\,dx + \int -\frac{2ab\operatorname{asin}(cx)}{x}\,dx + \int b^2c^2x\operatorname{asin}^2(cx)\,dx + \int 2abc^2x\operatorname{asin}\right($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] -d*(Integral(-a**2/x, x) + Integral(a**2*c**2*x, x) + Integral(-b**2*asin(c
*x)**2/x, x) + Integral(-2*a*b*asin(c*x)/x, x) + Integral(b**2*c**2*x*asin(
c*x)**2, x) + Integral(2*a*b*c**2*x*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2 - d\right)(b\arcsin(cx) + a)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x, x)
```

3.162 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=149

$$2ib^2cd\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-2ib^2cd\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-2bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x}$$

```
[Out] 2*b^2*c^2*d*x - 2*b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - 2*c^2*d*x*(
a + b*ArcSin[c*x])^2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/x - 4*b*c*d*
(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d*PolyLog[2, -
E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rubi [A] time = 0.297993, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {4695, 4619, 4677, 8, 4697, 4709, 4183, 2279, 2391}

$$2ib^2cd\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-2ib^2cd\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-2bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] 2*b^2*c^2*d*x - 2*b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - 2*c^2*d*x*(
a + b*ArcSin[c*x])^2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/x - 4*b*c*d*
(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d*PolyLog[2, -
E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x} + (2bcd)\int \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x}\,dx - (\ldots$$

$$= 2bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d\left(1-c^2x^2\right)\left(a+\ldots\right.}{x}$$

$$= -2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d\left(1-\ldots\right.}{}$$

$$= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d\left(1-\ldots\right.}{}$$

$$= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d\left(1-\ldots\right.}{}$$

$$= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d\left(1-\ldots\right.}{}$$

Mathematica [A] time = 0.410173, size = 203, normalized size = 1.36

$$-\frac{d\left(-ib^2\left(2cx\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-2cx\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+i\sin^{-1}(cx)\left(\sin^{-1}(cx)+2cx\left(\log\left(1+e^{i\sin^{-1}(cx)}\right)-\right.\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((d*(a^2 + a^2*c^2*x^2 + 2*a*b*c*x*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) +
 b^2*c*x*(2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + c*x*(-2 + ArcSin[c*x]^2)) + 2*a
*b*(ArcSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]) - I*b^2*(I*ArcSin[c*x]*(A
rcSin[c*x] + 2*c*x*(-Log[1 - E^(I*ArcSin[c*x])] + Log[1 + E^(I*ArcSin[c*x])
])) + 2*c*x*PolyLog[2, -E^(I*ArcSin[c*x])] - 2*c*x*PolyLog[2, E^(I*ArcSin[c
*x])])))/x)
```

Maple [A] time = 0.221, size = 269, normalized size = 1.8

$$-da^2c^2x-\frac{da^2}{x}-2\,cdb^2\arcsin(cx)\sqrt{-c^2x^2+1}-db^2(\arcsin(cx))^2c^2x+2\,b^2c^2dx-\frac{db^2(\arcsin(cx))^2}{x}-2\,cdb^2\arcsin(c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] -d*a^2*c^2*x-d*a^2/x-2*c*d*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-d*b^2*arcsin(
c*x)^2*c^2*x+2*b^2*c^2*d*x-d*b^2/x*arcsin(c*x)^2-2*c*d*b^2*arcsin(c*x)*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))+2*c*d*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1
/2))+2*I*b^2*c*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*c*d*polylog(2
,I*c*x+(-c^2*x^2+1)^(1/2))-2*d*a*b*c^2*x*arcsin(c*x)-2*d*a*b/x*arcsin(c*x)-
2*c*d*a*b*(-c^2*x^2+1)^(1/2)-2*c*d*a*b*arctanh(1/(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-b^2c^2dx\arcsin(cx)^2+2\,b^2c^2d\left(x-\frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right)-a^2c^2dx-2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)abcd-2\left(c\log\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] -b^2*c^2*d*x*arcsin(c*x)^2 + 2*b^2*c^2*d*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x
)/c) - a^2*c^2*d*x - 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d - 2*(
c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d - (2*c
*x*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1))/(c^2*x^3 - x), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)
*b^2*d/x - a^2*d/x
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2c^2dx^2-a^2d+\left(b^2c^2dx^2-b^2d\right)\arcsin(cx)^2+2\left(abc^2dx^2-abd\right)\arcsin(cx)}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int a^2c^2\,dx+\int -\frac{a^2}{x^2}\,dx+\int b^2c^2\operatorname{asin}^2(cx)\,dx+\int -\frac{b^2\operatorname{asin}^2(cx)}{x^2}\,dx+\int 2abc^2\operatorname{asin}(cx)\,dx+\int -\frac{2ab\operatorname{asin}(cx)}{x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] -d*(Integral(a**2*c**2, x) + Integral(-a**2/x**2, x) + Integral(b**2*c**2*a
sin(c*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**2, x) + Integral(2*a*b*c**
2*asin(c*x), x) + Integral(-2*a*b*asin(c*x)/x**2, x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2-d\right)(b\arcsin(cx)+a)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x^2, x)
```

3.163 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=193

$$ibc^2d\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}b^2c^2d\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}-\frac{bcd\sqrt{\ }}{}$$

```
[Out] -((b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/x) - (c^2*d*(a + b*ArcSin[c
*x])^2)/2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + ((I/3)*c^2*d*
(a + b*ArcSin[c*x])^3)/b - c^2*d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Arc
Sin[c*x])] + b^2*c^2*d*Log[x] + I*b*c^2*d*(a + b*ArcSin[c*x])*PolyLog[2, E^
((2*I)*ArcSin[c*x])] - (b^2*c^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rubi [A] time = 0.286697, antiderivative size = 193, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4695, 4625, 3717, 2190, 2531, 2282, 6589, 4693, 29, 4641}

$$ibc^2d\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}b^2c^2d\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}-\frac{bcd\sqrt{\ }}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```



```
[Out] -((b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/x) - (c^2*d*(a + b*ArcSin[c
*x])^2)/2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + ((I/3)*c^2*d*
(a + b*ArcSin[c*x])^3)/b - c^2*d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Arc
Sin[c*x])] + b^2*c^2*d*Log[x] + I*b*c^2*d*(a + b*ArcSin[c*x])*PolyLog[2, E^
((2*I)*ArcSin[c*x])] - (b^2*c^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx = -\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}+(bcd)\int \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx-\left(c^2d\right)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}-\left(c^2d\right)\text{Subst}\Big($$

$$= -\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2-\frac{d\left(1-c^2x^2\right)\left(a+b\,\text{si}\right.}{2x^2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2-\frac{d\left(1-c^2x^2\right)\left(a+b\,\text{si}\right.}{2x^2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2-\frac{d\left(1-c^2x^2\right)\left(a+b\,\text{si}\right.}{2x^2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2-\frac{d\left(1-c^2x^2\right)\left(a+b\,\text{si}\right.}{2x^2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2-\frac{d\left(1-c^2x^2\right)\left(a+b\,\text{si}\right.}{2x^2}$$

Mathematica [A] time = 0.392648, size = 236, normalized size = 1.22

$$\frac{1}{2}d\left(2iabc^2\left(\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\log\left(1-e^{2i\sin^{-1}(cx)}\right)\right)\right)+\frac{1}{12}ib^2c^2\left(-24\sin^{-1}(cx)\text{PolyLog}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d*(-(a^2/x^2) - (2*a*b*(c*x*Sqrt[1 - c^2*x^2] + ArcSin[c*x]))/x^2 - 2*a^2*
c^2*Log[x] - (b^2*(2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 2*
c^2*x^2*Log[c*x]))/x^2 + (2*I)*a*b*c^2*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*Lo
g[1 - E^((2*I)*ArcSin[c*x])]) + PolyLog[2, E^((2*I)*ArcSin[c*x])]) + (I/12)
*b^2*c^2*(Pi^3 - 8*ArcSin[c*x]^3 + (24*I)*ArcSin[c*x]^2*Log[1 - E^((-2*I)*A
rcSin[c*x])] - 24*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (12*I)*P
olyLog[3, E^((-2*I)*ArcSin[c*x])])))/2
```

Maple [B] time = 0.337, size = 564, normalized size = 2.9

$$-\frac{da^2}{2x^2}-c^2da^2\ln(cx)+ic^2dab+2ic^2dab\,\text{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)-\frac{dcb^2\arcsin(cx)}{x}\sqrt{-c^2x^2+1}-\frac{db^2(\arcsin(cx}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x)
```

```
[Out] -1/2*d*a^2/x^2-c^2*d*a^2*ln(c*x)+I*c^2*d*a*b+2*I*c^2*d*a*b*polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))-c*d*b^2*arcsin(c*x)/x*(-c^2*x^2+1)^(1/2)-1/2*d*b^2*arc
sin(c*x)^2/x^2-c^2*d*b^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*c
^2*d*b^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*c^2*d*b^2*polyl
og(3,-I*c*x-(-c^2*x^2+1)^(1/2))-c^2*d*b^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^
2+1)^(1/2))+I*c^2*d*b^2*arcsin(c*x)-2*c^2*d*b^2*polylog(3,I*c*x+(-c^2*x^2+1
)^(1/2))+c^2*d*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+c^2*d*b^2*ln(1+I*c*x+(-c^
```

```
2*x^2+1)^(1/2))-2*c^2*d*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2))+I*c^2*d*a*b*arcsin
(c*x)^2+2*I*c^2*d*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-c*d*a*b/x*(-c^2*x
^2+1)^(1/2)-d*a*b*arcsin(c*x)/x^2-2*c^2*d*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2))-2*c^2*d*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/3*I*
c^2*d*b^2*arcsin(c*x)^3+2*I*c^2*d*b^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2
+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-a^2c^2d\log(x) - abd\left(\frac{\sqrt{-c^2x^2+1}c}{x} + \frac{\arcsin(cx)}{x^2}\right) - \frac{a^2d}{2x^2} - \int \frac{2abc^2dx^2\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + \left(b^2c^2dx^2 - \right.}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] -a^2*c^2*d*log(x) - a*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*
a^2*d/x^2 - integrate((2*a*b*c^2*d*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + (b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
^2)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2c^2dx^2 - a^2d + \left(b^2c^2dx^2 - b^2d\right)\arcsin(cx)^2 + 2\left(abc^2dx^2 - abd\right)\arcsin(cx)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int -\frac{a^2}{x^3}\,dx + \int \frac{a^2c^2}{x}\,dx + \int -\frac{b^2\operatorname{asin}^2(cx)}{x^3}\,dx + \int -\frac{2ab\operatorname{asin}(cx)}{x^3}\,dx + \int \frac{b^2c^2\operatorname{asin}^2(cx)}{x}\,dx + \int \frac{2abc^2\operatorname{asin}(cx}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] -d*(Integral(-a**2/x**3, x) + Integral(a**2*c**2/x, x) + Integral(-b**2*asi
n(c*x)**2/x**3, x) + Integral(-2*a*b*asin(c*x)/x**3, x) + Integral(b**2*c**
2*asin(c*x)**2/x, x) + Integral(2*a*b*c**2*asin(c*x)/x, x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2 - d\right)\left(b\arcsin(cx) + a\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x^3, x)
```

3.164 $\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=176

$$-\frac{5}{3}ib^2c^3d\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+\frac{5}{3}ib^2c^3d\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2}-\frac{d\,(1-c^2x^2)\,(}{}$$

```
[Out] -(b^2*c^2*d)/(3*x) - (b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*x^2)
+ (2*c^2*d*(a + b*ArcSin[c*x])^2)/(3*x) - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*
x])^2)/(3*x^3) + (10*b*c^3*d*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])]
)/3 - ((5*I)/3)*b^2*c^3*d*PolyLog[2, -E^(I*ArcSin[c*x])] + ((5*I)/3)*b^2*c^
3*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rubi [A] time = 0.376732, antiderivative size = 176, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {4695, 4627, 4709, 4183, 2279, 2391, 4693, 30}

$$-\frac{5}{3}ib^2c^3d\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+\frac{5}{3}ib^2c^3d\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2}-\frac{d\,(1-c^2x^2)\,(}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -(b^2*c^2*d)/(3*x) - (b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*x^2)
+ (2*c^2*d*(a + b*ArcSin[c*x])^2)/(3*x) - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*
x])^2)/(3*x^3) + (10*b*c^3*d*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])]
)/3 - ((5*I)/3)*b^2*c^3*d*PolyLog[2, -E^(I*ArcSin[c*x])] + ((5*I)/3)*b^2*c^
3*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx &= -\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3x^3}+\frac{1}{3}(2bcd)\int \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx-\frac{1}{3}\\
&= -\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}+\frac{2c^2d\left(a+b\sin^{-1}(cx)\right)^2}{3x}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin\right.}{3x^3}\\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}+\frac{2c^2d\left(a+b\sin^{-1}(cx)\right)^2}{3x}-\frac{d\left(1-c^2x^2\right)}{}\\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}+\frac{2c^2d\left(a+b\sin^{-1}(cx)\right)^2}{3x}-\frac{d\left(1-c^2x^2\right)}{}\\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}+\frac{2c^2d\left(a+b\sin^{-1}(cx)\right)^2}{3x}-\frac{d\left(1-c^2x^2\right)}{}\\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}+\frac{2c^2d\left(a+b\sin^{-1}(cx)\right)^2}{3x}-\frac{d\left(1-c^2x^2\right)}{}\end{aligned}$$

Mathematica [A] time = 0.743432, size = 266, normalized size = 1.51

$$\frac{d\left(-5ib^2c^3x^3\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+5ib^2c^3x^3\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+3a^2c^2x^2-a^2-abcx\sqrt{1-c^2x^2}+6abc^2x^2\sin^{-1}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d*(-a^2 + 3*a^2*c^2*x^2 - b^2*c^2*x^2 - a*b*c*x*Sqrt[1 - c^2*x^2] - 2*a*b*
ArcSin[c*x] + 6*a*b*c^2*x^2*ArcSin[c*x] - b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[
c*x] - b^2*ArcSin[c*x]^2 + 3*b^2*c^2*x^2*ArcSin[c*x]^2 + 5*a*b*c^3*x^3*ArcT
anh[Sqrt[1 - c^2*x^2]] - 5*b^2*c^3*x^3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x]
)] + 5*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (5*I)*b^2*c^3*x
^3*PolyLog[2, -E^(I*ArcSin[c*x])] + (5*I)*b^2*c^3*x^3*PolyLog[2, E^(I*ArcSi
n[c*x])]))/(3*x^3)
```

Maple [A] time = 0.361, size = 291, normalized size = 1.7

$$\frac{c^2da^2}{x}-\frac{da^2}{3x^3}+\frac{c^2db^2(\arcsin(cx))^2}{x}-\frac{dcb^2\arcsin(cx)}{3x^2}\sqrt{-c^2x^2+1}-\frac{db^2(\arcsin(cx))^2}{3x^3}-\frac{c^2db^2}{3x}+\frac{5dc^3b^2\arcsin(cx)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x)
```

```
[Out] c^2*d*a^2/x-1/3*d*a^2/x^3+c^2*d*b^2/x*arcsin(c*x)^2-1/3*c*d*b^2/x^2*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)-1/3*d*b^2/x^3*arcsin(c*x)^2-1/3*b^2*c^2*d/x+5/3*c^3
*d*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-5/3*I*b^2*c^3*d*polylog(2
,-I*c*x-(-c^2*x^2+1)^(1/2))-5/3*c^3*d*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+
1)^(1/2))+5/3*I*b^2*c^3*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*c^2*d*a*b/x
*arcsin(c*x)-2/3*d*a*b*arcsin(c*x)/x^3-1/3*c*d*a*b/x^2*(-c^2*x^2+1)^(1/2)+5
/3*c^3*d*a*b*arctanh(1/(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)abc^2d-\frac{1}{3}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] 2*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*c^2*d
 - 1/3*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 +
1)/x^2)*c + 2*arcsin(c*x)/x^3)*a*b*d + a^2*c^2*d/x - 1/3*a^2*d/x^3 + 1/3*(3
*x^3*integrate(2/3*(3*b^2*c^3*d*x^2 - b^2*c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 - x^3), x) + (3*b^2*c^
2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/x^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2c^2dx^2-a^2d+\left(b^2c^2dx^2-b^2d\right)\arcsin(cx)^2+2\left(abc^2dx^2-abd\right)\arcsin(cx)}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")

[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^4, x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int -\frac{a^2}{x^4}\,dx + \int \frac{a^2c^2}{x^2}\,dx + \int -\frac{b^2\operatorname{asin}^2(cx)}{x^4}\,dx + \int -\frac{2ab\operatorname{asin}(cx)}{x^4}\,dx + \int \frac{b^2c^2\operatorname{asin}^2(cx)}{x^2}\,dx + \int \frac{2abc^2\operatorname{asin}(cx)}{x^2}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**4,x)

[Out] -d*(Integral(-a**2/x**4, x) + Integral(a**2*c**2/x**2, x) + Integral(-b**2*asin(c*x)**2/x**4, x) + Integral(-2*a*b*asin(c*x)/x**4, x) + Integral(b**2*c**2*asin(c*x)**2/x**2, x) + Integral(2*a*b*c**2*asin(c*x)/x**2, x))

Giac [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")

[Out] sage0*x

3.165 $\int x^4 \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=395

$$\frac{1}{9}d^2x^5\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{4}{63}d^2x^5\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{16bd^2x^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{1575c}+\frac{6}{}$$

```
[Out] (-4208*b^2*d^2*x)/(99225*c^4) - (2104*b^2*d^2*x^3)/(297675*c^2) - (526*b^2*
d^2*x^5)/165375 + (212*b^2*c^2*d^2*x^7)/27783 - (2*b^2*c^4*d^2*x^9)/729 + (
128*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^5) + (64*b*d^2*x^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^3) + (16*b*d^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(1575*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a +
 b*ArcSin[c*x]))/(189*c^5) - (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(315*c^5) - (20*b*d^2*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(441*c^5
) + (2*b*d^2*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^5) + (8*d^2*x^5
*(a + b*ArcSin[c*x])^2)/315 + (4*d^2*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^
2)/63 + (d^2*x^5*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/9
```

Rubi [A] time = 0.724235, antiderivative size = 395, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4699, 4627, 4707, 4677, 8, 30, 266, 43, 4689, 12, 1153}

$$\frac{1}{9}d^2x^5\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{4}{63}d^2x^5\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{16bd^2x^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{1575c}+\frac{6}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-4208*b^2*d^2*x)/(99225*c^4) - (2104*b^2*d^2*x^3)/(297675*c^2) - (526*b^2*
d^2*x^5)/165375 + (212*b^2*c^2*d^2*x^7)/27783 - (2*b^2*c^4*d^2*x^9)/729 + (
128*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^5) + (64*b*d^2*x^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^3) + (16*b*d^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(1575*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a +
 b*ArcSin[c*x]))/(189*c^5) - (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(315*c^5) - (20*b*d^2*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(441*c^5
) + (2*b*d^2*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^5) + (8*d^2*x^5
*(a + b*ArcSin[c*x])^2)/315 + (4*d^2*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^
2)/63 + (d^2*x^5*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/9
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
```

```
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rubi steps

$$\int x^4 \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{9}d^2x^5\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{9}(4d)\int x^4\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(\right.$$

$$= \frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{45c^5}-\frac{4bd^2\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{63c^5}+$$

$$= \frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{189c^5}-\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{315c^5}-$$

$$= \frac{16bd^2x^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{1575c}+\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{189c^5}-$$

$$= -\frac{304b^2d^2x}{19845c^4}-\frac{152b^2d^2x^3}{59535c^2}-\frac{526b^2d^2x^5}{165375}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c^4d^2x^9+\frac{64}{}$$

$$= -\frac{304b^2d^2x}{19845c^4}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c^4d^2x^9+\frac{1}{}$$

$$= -\frac{4208b^2d^2x}{99225c^4}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c^4d^2x^9+$$

Mathematica [A] time = 0.246725, size = 253, normalized size = 0.64

$$\frac{d^2\left(99225a^2c^5x^5\left(35c^4x^4-90c^2x^2+63\right)+630ab\sqrt{1-c^2x^2}\left(1225c^8x^8-2650c^6x^6+789c^4x^4+1052c^2x^2+2104\right)+63\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(99225*a^2*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + 630*a*b*Sqrt[1 - c
^2*x^2]*(2104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^8) -
 2*b^2*c*x*(662760 + 110460*c^2*x^2 + 49707*c^4*x^4 - 119250*c^6*x^6 + 4287
5*c^8*x^8) + 630*b*(315*a*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + b*Sqrt[1
 - c^2*x^2]*(2104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^
8))*ArcSin[c*x] + 99225*b^2*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4)*ArcSin[c
*x]^2))/(31255875*c^5)
```

Maple [A] time = 0.159, size = 531, normalized size = 1.3

$$\frac{1}{c^5}\left(d^2a^2\left(\frac{c^9x^9}{9}-\frac{2c^7x^7}{7}+\frac{c^5x^5}{5}\right)+d^2b^2\left(\frac{(\arcsin(cx))^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}-\frac{16cx}{315}+\frac{16\arcsin(cx)}{315}\sqrt{-c^2x^2+}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^5*(d^2*a^2*(1/9*c^9*x^9-2/7*c^7*x^7+1/5*c^5*x^5)+d^2*b^2*(1/15*arcsin(c
*x)^2*(3*c^4*x^4-10*c^2*x^2+15)*c*x-16/315*c*x+16/315*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)+2/525*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)-2/7875*(3*c^4*
x^4-10*c^2*x^2+15)*c*x-8/945*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+8/2
835*(c^2*x^2-3)*c*x+2/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)
*c*x+20/441*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-4/3087*(5*c^6*x^6-
21*c^4*x^4+35*c^2*x^2-35)*c*x+1/315*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^6+3
78*c^4*x^4-420*c^2*x^2+315)*c*x+2/81*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)
^(1/2)-2/25515*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x)+2*
d^2*a*b*(1/9*arcsin(c*x)*c^9*x^9-2/7*arcsin(c*x)*c^7*x^7+1/5*arcsin(c*x)*c^
5*x^5+1/81*c^8*x^8*(-c^2*x^2+1)^(1/2)-106/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+2
63/33075*c^4*x^4*(-c^2*x^2+1)^(1/2)+1052/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)+2
104/99225*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.76553, size = 1054, normalized size = 2.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/9*b^2*c^4*d^2*x^9*arcsin(c*x)^2 + 1/9*a^2*c^4*d^2*x^9 - 2/7*b^2*c^2*d^2*x
^7*arcsin(c*x)^2 - 2/7*a^2*c^2*d^2*x^7 + 1/5*b^2*d^2*x^5*arcsin(c*x)^2 + 2/
2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x
^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2
/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*a*b*c^4*d^2 + 2/893025*(315*(35*sqrt
(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 +
 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*
c*arcsin(c*x) - (1225*c^8*x^9 + 1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2*x^3
+ 40320*x)/c^8)*b^2*c^4*d^2 + 1/5*a^2*d^2*x^5 - 4/245*(35*x^7*arcsin(c*x) +
 (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2
*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^2*d^2 - 4/25725*(10
5*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^
2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7
 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^2*d^2 + 2/75*(15*x^5*arcs
in(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*
sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d^2 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c
^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x)
 - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*d^2
```

Fricas [A] time = 1.89997, size = 810, normalized size = 2.05

$$\frac{42875\left(81\,a^2-2\,b^2\right)c^9d^2x^9-2250\left(3969\,a^2-106\,b^2\right)c^7d^2x^7+189\left(33075\,a^2-526\,b^2\right)c^5d^2x^5-220920\,b^2c^3d^2x^3-13255}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/31255875*(42875*(81*a^2 - 2*b^2)*c^9*d^2*x^9 - 2250*(3969*a^2 - 106*b^2)*
c^7*d^2*x^7 + 189*(33075*a^2 - 526*b^2)*c^5*d^2*x^5 - 220920*b^2*c^3*d^2*x^
3 - 1325520*b^2*c*d^2*x + 99225*(35*b^2*c^9*d^2*x^9 - 90*b^2*c^7*d^2*x^7 +
63*b^2*c^5*d^2*x^5)*arcsin(c*x)^2 + 198450*(35*a*b*c^9*d^2*x^9 - 90*a*b*c^7
*d^2*x^7 + 63*a*b*c^5*d^2*x^5)*arcsin(c*x) + 630*(1225*a*b*c^8*d^2*x^8 - 26
```

```
50*a*b*c^6*d^2*x^6 + 789*a*b*c^4*d^2*x^4 + 1052*a*b*c^2*d^2*x^2 + 2104*a*b*
d^2 + (1225*b^2*c^8*d^2*x^8 - 2650*b^2*c^6*d^2*x^6 + 789*b^2*c^4*d^2*x^4 +
1052*b^2*c^2*d^2*x^2 + 2104*b^2*d^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 57.5583, size = 563, normalized size = 1.43

$$\begin{cases} \frac{a^2c^4d^2x^9}{9} - \frac{2a^2c^2d^2x^7}{7} + \frac{a^2d^2x^5}{5} + \frac{2abc^4d^2x^9\operatorname{asin}(cx)}{9} + \frac{2abc^3d^2x^8\sqrt{-c^2x^2+1}}{81} - \frac{4abc^2d^2x^7\operatorname{asin}(cx)}{7} - \frac{212abcd^2x^6\sqrt{-c^2x^2+1}}{3969} + \frac{2abd^2x^5\operatorname{asin}(cx}{5} \\ \frac{a^2d^2x^5}{5} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**9/9 - 2*a**2*c**2*d**2*x**7/7 + a**2*d**2*x**5
/5 + 2*a*b*c**4*d**2*x**9*asin(c*x)/9 + 2*a*b*c**3*d**2*x**8*sqrt(-c**2*x**
2 + 1)/81 - 4*a*b*c**2*d**2*x**7*asin(c*x)/7 - 212*a*b*c*d**2*x**6*sqrt(-c*
*2*x**2 + 1)/3969 + 2*a*b*d**2*x**5*asin(c*x)/5 + 526*a*b*d**2*x**4*sqrt(-c
**2*x**2 + 1)/(33075*c) + 2104*a*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(99225*c*
*3) + 4208*a*b*d**2*sqrt(-c**2*x**2 + 1)/(99225*c**5) + b**2*c**4*d**2*x**9
*asin(c*x)**2/9 - 2*b**2*c**4*d**2*x**9/729 + 2*b**2*c**3*d**2*x**8*sqrt(-c
**2*x**2 + 1)*asin(c*x)/81 - 2*b**2*c**2*d**2*x**7*asin(c*x)**2/7 + 212*b**
2*c**2*d**2*x**7/27783 - 212*b**2*c*d**2*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x
)/3969 + b**2*d**2*x**5*asin(c*x)**2/5 - 526*b**2*d**2*x**5/165375 + 526*b*
*2*d**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(33075*c) - 2104*b**2*d**2*x**3
/(297675*c**2) + 2104*b**2*d**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(99225*
c**3) - 4208*b**2*d**2*x/(99225*c**4) + 4208*b**2*d**2*sqrt(-c**2*x**2 + 1)
*asin(c*x)/(99225*c**5), Ne(c, 0)), (a**2*d**2*x**5/5, True))
```

Giac [B] time = 1.58319, size = 948, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/9*a^2*c^4*d^2*x^9 - 2/7*a^2*c^2*d^2*x^7 + 1/5*a^2*d^2*x^5 + 1/9*(c^2*x^2
- 1)^4*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/9*(c^2*x^2 - 1)^4*a*b*d^2*x*arcsin(c
*x)/c^4 + 10/63*(c^2*x^2 - 1)^3*b^2*d^2*x*arcsin(c*x)^2/c^4 - 2/729*(c^2*x^
2 - 1)^4*b^2*d^2*x/c^4 + 20/63*(c^2*x^2 - 1)^3*a*b*d^2*x*arcsin(c*x)/c^4 +
1/105*(c^2*x^2 - 1)^2*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/81*(c^2*x^2 - 1)^4*sq
rt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 - 836/250047*(c^2*x^2 - 1)^3*b^2*d
^2*x/c^4 + 2/105*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x)/c^4 - 4/315*(c^2*x^2
 - 1)*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)
*a*b*d^2/c^5 + 20/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x
)/c^5 + 33862/10418625*(c^2*x^2 - 1)^2*b^2*d^2*x/c^4 - 8/315*(c^2*x^2 - 1)*
a*b*d^2*x*arcsin(c*x)/c^4 + 8/315*b^2*d^2*x*arcsin(c*x)^2/c^4 + 20/441*(c^2
*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^5 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^
2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 - 47248/31255875*(c^2*x^2 - 1)*b^2*d^2*x
/c^4 + 16/315*a*b*d^2*x*arcsin(c*x)/c^4 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x
^2 + 1)*a*b*d^2/c^5 + 8/945*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*arcsin(c*x)/c^5 -
1493104/31255875*b^2*d^2*x/c^4 + 8/945*(-c^2*x^2 + 1)^(3/2)*a*b*d^2/c^5 + 1
6/315*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 + 16/315*sqrt(-c^2*x^2 + 1
)*a*b*d^2/c^5
```

3.166 $\int x^3 \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 dx$

Optimal. Leaf size=302

$$-\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2$$

```
[Out] (-73*b^2*d^2*x^2)/(3072*c^2) - (73*b^2*d^2*x^4)/9216 + (43*b^2*c^2*d^2*x^6)
/3456 - (b^2*c^4*d^2*x^8)/256 + (73*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(1536*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(
2304*c) - (25*b*c*d^2*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/576 - (b*c
*d^2*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/32 - (73*d^2*(a + b*ArcSi
n[c*x])^2)/(3072*c^4) + (d^2*x^4*(a + b*ArcSin[c*x])^2)/24 + (d^2*x^4*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/12 + (d^2*x^4*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/8
```

Rubi [A] time = 1.00818, antiderivative size = 302, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4699, 4627, 4707, 4641, 30, 4697, 14}

$$-\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-73*b^2*d^2*x^2)/(3072*c^2) - (73*b^2*d^2*x^4)/9216 + (43*b^2*c^2*d^2*x^6)
/3456 - (b^2*c^4*d^2*x^8)/256 + (73*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(1536*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(
2304*c) - (25*b*c*d^2*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/576 - (b*c
*d^2*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/32 - (73*d^2*(a + b*ArcSi
n[c*x])^2)/(3072*c^4) + (d^2*x^4*(a + b*ArcSin[c*x])^2)/24 + (d^2*x^4*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/12 + (d^2*x^4*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/8
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^3 \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx = \frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{2}d\int x^3\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right.$$
$$= -\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{12}d^2x^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(\right.$$
$$= -\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.$$
$$= \frac{43b^2c^2d^2x^6}{3456}-\frac{1}{256}b^2c^4d^2x^8+\frac{73bd^2x^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2304c}-\frac{25}{576}bc$$
$$= -\frac{73b^2d^2x^4}{9216}+\frac{43b^2c^2d^2x^6}{3456}-\frac{1}{256}b^2c^4d^2x^8+\frac{73bd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{1536c^3}$$
$$= -\frac{73b^2d^2x^2}{3072c^2}-\frac{73b^2d^2x^4}{9216}+\frac{43b^2c^2d^2x^6}{3456}-\frac{1}{256}b^2c^4d^2x^8+\frac{73bd^2x\sqrt{1-c^2x^2}\left(\right.}{1536}$$

Mathematica [A] time = 0.238716, size = 239, normalized size = 0.79

$$d^2\left(cx\left(1152a^2c^3x^3\left(3c^4x^4-8c^2x^2+6\right)+6ab\sqrt{1-c^2x^2}\left(144c^6x^6-344c^4x^4+146c^2x^2+219\right)-b^2cx\left(108c^6x^6-344c^4\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(c*x*(1152*a^2*c^3*x^3*(6 - 8*c^2*x^2 + 3*c^4*x^4) - b^2*c*x*(657 + 21
9*c^2*x^2 - 344*c^4*x^4 + 108*c^6*x^6) + 6*a*b*Sqrt[1 - c^2*x^2]*(219 + 146
*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6)) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(219
+ 146*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6) + 3*a*(-73 + 768*c^4*x^4 - 1024*
c^6*x^6 + 384*c^8*x^8))*ArcSin[c*x] + 9*b^2*(-73 + 768*c^4*x^4 - 1024*c^6*x
^6 + 384*c^8*x^8)*ArcSin[c*x]^2))/(27648*c^4)
```

Maple [A] time = 0.139, size = 424, normalized size = 1.4

$$\frac{1}{c^4}\left(d^2a^2\left(\frac{c^8x^8}{8}-\frac{c^6x^6}{3}+\frac{c^4x^4}{4}\right)+d^2b^2\left(\frac{(\arcsin(cx))^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)}{144}\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^4*(d^2*a^2*(1/8*c^8*x^8-1/3*c^6*x^6+1/4*c^4*x^4)+d^2*b^2*(1/6*arcsin(c*
x)^2*(c^2*x^2-1)^3+1/144*arcsin(c*x)*(8*c^5*x^5*(-c^2*x^2+1)^(1/2)-26*c^3*x
^3*(-c^2*x^2+1)^(1/2)+33*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-55/3072*arc
sin(c*x)^2-11/3456*(c^2*x^2-1)^3+55/9216*(c^2*x^2-1)^2-55/3072*c^2*x^2+55/3
072+1/8*arcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x
^2+1)^(1/2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+2
79*c*x*(-c^2*x^2+1)^(1/2)+105*arcsin(c*x))-1/256*(c^2*x^2-1)^4)+2*d^2*a*b*(
1/8*arcsin(c*x)*c^8*x^8-1/3*arcsin(c*x)*c^6*x^6+1/4*c^4*x^4*arcsin(c*x)+1/6
4*c^7*x^7*(-c^2*x^2+1)^(1/2)-43/1152*c^5*x^5*(-c^2*x^2+1)^(1/2)+73/4608*c^3
*x^3*(-c^2*x^2+1)^(1/2)+73/3072*c*x*(-c^2*x^2+1)^(1/2)-73/3072*arcsin(c*x))
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{8}a^2c^4d^2x^8-\frac{1}{3}a^2c^2d^2x^6+\frac{1}{1536}\left(384x^8\arcsin(cx)+\left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2}+\frac{56\sqrt{-c^2x^2+1}x^5}{c^4}+\frac{70\sqrt{-c^2x^2+1}x^3}{c^6}+\frac{105\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/8*a^2*c^4*d^2*x^8 - 1/3*a^2*c^2*d^2*x^6 + 1/1536*(384*x^8*arcsin(c*x) + (
48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^
2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(c
^2))/(sqrt(c^2)*c^8))*c)*a*b*c^4*d^2 + 1/4*a^2*d^2*x^4 - 1/72*(48*x^6*arcsi
n(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15
*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*
a*b*c^2*d^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*s
qrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*a*b
*d^2 + 1/24*(3*b^2*c^4*d^2*x^8 - 8*b^2*c^2*d^2*x^6 + 6*b^2*d^2*x^4)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(1/12*(3*b^2*c^5*d^2*x^8 -
 8*b^2*c^3*d^2*x^6 + 6*b^2*c*d^2*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(
```

```
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Fricas [A] time = 1.88243, size = 729, normalized size = 2.41

$$\frac{108\left(32\,a^2-b^2\right)c^8d^2x^8-8\left(1152\,a^2-43\,b^2\right)c^6d^2x^6+3\left(2304\,a^2-73\,b^2\right)c^4d^2x^4-657\,b^2c^2d^2x^2+9\left(384\,b^2c^8d^2x^8-10\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27648*(108*(32*a^2 - b^2)*c^8*d^2*x^8 - 8*(1152*a^2 - 43*b^2)*c^6*d^2*x^6
 + 3*(2304*a^2 - 73*b^2)*c^4*d^2*x^4 - 657*b^2*c^2*d^2*x^2 + 9*(384*b^2*c^8
*d^2*x^8 - 1024*b^2*c^6*d^2*x^6 + 768*b^2*c^4*d^2*x^4 - 73*b^2*d^2)*arcsin(
c*x)^2 + 18*(384*a*b*c^8*d^2*x^8 - 1024*a*b*c^6*d^2*x^6 + 768*a*b*c^4*d^2*x
^4 - 73*a*b*d^2)*arcsin(c*x) + 6*(144*a*b*c^7*d^2*x^7 - 344*a*b*c^5*d^2*x^5
 + 146*a*b*c^3*d^2*x^3 + 219*a*b*c*d^2*x + (144*b^2*c^7*d^2*x^7 - 344*b^2*c
^5*d^2*x^5 + 146*b^2*c^3*d^2*x^3 + 219*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*
x^2 + 1))/c^4
```

Sympy [A] time = 38.1413, size = 515, normalized size = 1.71

$$\begin{cases}\frac{a^2c^4d^2x^8}{8}-\frac{a^2c^2d^2x^6}{3}+\frac{a^2d^2x^4}{4}+\frac{abc^4d^2x^8\operatorname{asin}(cx)}{4}+\frac{abc^3d^2x^7\sqrt{-c^2x^2+1}}{32}-\frac{2abc^2d^2x^6\operatorname{asin}(cx)}{3}-\frac{43abcd^2x^5\sqrt{-c^2x^2+1}}{576}+\frac{abd^2x^4\operatorname{asin}(cx)}{2}+\frac{7}{} \\ \frac{a^2d^2x^4}{4}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**8/8 - a**2*c**2*d**2*x**6/3 + a**2*d**2*x**4/4
 + a*b*c**4*d**2*x**8*asin(c*x)/4 + a*b*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)
/32 - 2*a*b*c**2*d**2*x**6*asin(c*x)/3 - 43*a*b*c*d**2*x**5*sqrt(-c**2*x**2
 + 1)/576 + a*b*d**2*x**4*asin(c*x)/2 + 73*a*b*d**2*x**3*sqrt(-c**2*x**2 +
1)/(2304*c) + 73*a*b*d**2*x*sqrt(-c**2*x**2 + 1)/(1536*c**3) - 73*a*b*d**2*
asin(c*x)/(1536*c**4) + b**2*c**4*d**2*x**8*asin(c*x)**2/8 - b**2*c**4*d**2
*x**8/256 + b**2*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)*asin(c*x)/32 - b**2*c*
*2*d**2*x**6*asin(c*x)**2/3 + 43*b**2*c**2*d**2*x**6/3456 - 43*b**2*c*d**2*
x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/576 + b**2*d**2*x**4*asin(c*x)**2/4 - 7
3*b**2*d**2*x**4/9216 + 73*b**2*d**2*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2
304*c) - 73*b**2*d**2*x**2/(3072*c**2) + 73*b**2*d**2*x*sqrt(-c**2*x**2 + 1
)*asin(c*x)/(1536*c**3) - 73*b**2*d**2*asin(c*x)**2/(3072*c**4), Ne(c, 0)),
 (a**2*d**2*x**4/4, True))
```

Giac [A] time = 1.57187, size = 711, normalized size = 2.35

$$\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}b^2d^2x\arcsin(cx)}{32\,c^3}+\frac{\left(c^2x^2-1\right)^4b^2d^2\arcsin(cx)^2}{8\,c^4}+\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}abd^2x}{32\,c^3}+\frac{11\left(c^2x^2-1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c^3 + 1/8*(c^
2*x^2 - 1)^4*b^2*d^2*arcsin(c*x)^2/c^4 + 1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2
 + 1)*a*b*d^2*x/c^3 + 11/576*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*a
rcsin(c*x)/c^3 + 1/4*(c^2*x^2 - 1)^4*a*b*d^2*arcsin(c*x)/c^4 + 1/6*(c^2*x^2
 - 1)^3*b^2*d^2*arcsin(c*x)^2/c^4 + 11/576*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 +
1)*a*b*d^2*x/c^3 + 55/2304*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*x*arcsin(c*x)/c^3 +
 1/8*(c^2*x^2 - 1)^4*a^2*d^2/c^4 - 1/256*(c^2*x^2 - 1)^4*b^2*d^2/c^4 + 1/3*
(c^2*x^2 - 1)^3*a*b*d^2*arcsin(c*x)/c^4 + 55/2304*(-c^2*x^2 + 1)^(3/2)*a*b*
d^2*x/c^3 + 55/1536*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c^3 + 1/6*(c^2
*x^2 - 1)^3*a^2*d^2/c^4 - 11/3456*(c^2*x^2 - 1)^3*b^2*d^2/c^4 + 55/1536*sqr
t(-c^2*x^2 + 1)*a*b*d^2*x/c^3 + 55/9216*(c^2*x^2 - 1)^2*b^2*d^2/c^4 + 55/30
72*b^2*d^2*arcsin(c*x)^2/c^4 - 55/3072*(c^2*x^2 - 1)*b^2*d^2/c^4 + 55/1536*
a*b*d^2*arcsin(c*x)/c^4 - 9835/884736*b^2*d^2/c^4
```

3.167 $\int x^2 \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=310

$$\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{4}{35}d^2x^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{16bd^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{315c}-\frac{2}{}$$

```
[Out] (-1636*b^2*d^2*x)/(11025*c^2) - (818*b^2*d^2*x^3)/33075 + (136*b^2*c^2*d^2*
x^5)/6125 - (2*b^2*c^4*d^2*x^7)/343 + (32*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(315*c^3) + (16*b*d^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(315*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*c^3) + (
2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c^3) - (2*b*d^2*(1 -
c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c^3) + (8*d^2*x^3*(a + b*ArcSin[c*x
])^2)/105 + (4*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (d^2*x^3*(
1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/7
```

Rubi [A] time = 0.570934, antiderivative size = 310, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4699, 4627, 4707, 4677, 8, 30, 266, 43, 4689, 12, 373}

$$\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{4}{35}d^2x^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{16bd^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{315c}-\frac{2}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-1636*b^2*d^2*x)/(11025*c^2) - (818*b^2*d^2*x^3)/33075 + (136*b^2*c^2*d^2*
x^5)/6125 - (2*b^2*c^4*d^2*x^7)/343 + (32*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(315*c^3) + (16*b*d^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(315*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*c^3) + (
2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c^3) - (2*b*d^2*(1 -
c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c^3) + (8*d^2*x^3*(a + b*ArcSin[c*x
])^2)/105 + (4*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (d^2*x^3*(
1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/7
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 373

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{7}(4d)\int x^2\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(\right.$$
$$=\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{35c^3}-\frac{2bd^2\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{49c^3}+$$
$$=\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{105c^3}+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{175c^3}-$$
$$=\frac{16bd^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{315c}+\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{105c^3}+$$
$$=-\frac{172b^2d^2x}{3675c^2}-\frac{818b^2d^2x^3}{33075}+\frac{136b^2c^2d^2x^5}{6125}-\frac{2}{343}b^2c^4d^2x^7+\frac{32bd^2\sqrt{1-c^2x^2}}{31}$$
$$=-\frac{1636b^2d^2x}{11025c^2}-\frac{818b^2d^2x^3}{33075}+\frac{136b^2c^2d^2x^5}{6125}-\frac{2}{343}b^2c^4d^2x^7+\frac{32bd^2\sqrt{1-c^2x}}{3}$$

Mathematica [A] time = 0.21692, size = 229, normalized size = 0.74

$$\frac{d^2\left(11025a^2c^3x^3\left(15c^4x^4-42c^2x^2+35\right)+210ab\sqrt{1-c^2x^2}\left(225c^6x^6-612c^4x^4+409c^2x^2+818\right)+210b\sin^{-1}(cx)\left(10\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(11025*a^2*c^3*x^3*(35 - 42*c^2*x^2 + 15*c^4*x^4) + 210*a*b*Sqrt[1 - c
^2*x^2]*(818 + 409*c^2*x^2 - 612*c^4*x^4 + 225*c^6*x^6) - 2*b^2*c*x*(85890
+ 14315*c^2*x^2 - 12852*c^4*x^4 + 3375*c^6*x^6) + 210*b*(105*a*c^3*x^3*(35
- 42*c^2*x^2 + 15*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(818 + 409*c^2*x^2 - 612*c
^4*x^4 + 225*c^6*x^6))*ArcSin[c*x] + 11025*b^2*c^3*x^3*(35 - 42*c^2*x^2 + 1
5*c^4*x^4)*ArcSin[c*x]^2))/(1157625*c^3)
```

Maple [A] time = 0.044, size = 400, normalized size = 1.3

$$\frac{1}{c^3}\left(d^2a^2\left(\frac{c^7x^7}{7}-\frac{2c^5x^5}{5}+\frac{c^3x^3}{3}\right)+d^2b^2\left(\frac{(\arcsin(cx))^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}-\frac{16cx}{105}+\frac{16\arcsin(cx)}{105}\sqrt{-c^2x^2+}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^3*(d^2*a^2*(1/7*c^7*x^7-2/5*c^5*x^5+1/3*c^3*x^3)+d^2*b^2*(1/15*arcsin(c
*x)^2*(3*c^4*x^4-10*c^2*x^2+15)*c*x-16/105*c*x+16/105*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)+2/175*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)-2/2625*(3*c^4*
x^4-10*c^2*x^2+15)*c*x-8/315*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+8/9
45*(c^2*x^2-3)*c*x+1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*
c*x+2/49*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/1715*(5*c^6*x^6-21*
c^4*x^4+35*c^2*x^2-35)*c*x)+2*d^2*a*b*(1/7*arcsin(c*x)*c^7*x^7-2/5*arcsin(c
*x)*c^5*x^5+1/3*c^3*x^3*arcsin(c*x)+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-68/1225
*c^4*x^4*(-c^2*x^2+1)^(1/2)+409/11025*c^2*x^2*(-c^2*x^2+1)^(1/2)+818/11025*
```

```
(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.86786, size = 856, normalized size = 2.76

$$\frac{1}{7}b^2c^4d^2x^7\arcsin(cx)^2+\frac{1}{7}a^2c^4d^2x^7-\frac{2}{5}b^2c^2d^2x^5\arcsin(cx)^2-\frac{2}{5}a^2c^2d^2x^5+\frac{2}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*c^4*d^2*x^7*arcsin(c*x)^2 + 1/7*a^2*c^4*d^2*x^7 - 2/5*b^2*c^2*d^2*x
^5*arcsin(c*x)^2 - 2/5*a^2*c^2*d^2*x^5 + 2/245*(35*x^7*arcsin(c*x) + (5*sqr
t(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^4*d^2 + 2/25725*(105*(5*sq
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*
c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^4*d^2 + 1/3*b^2*d^2*x^3*arcsin(c
*x)^2 - 4/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-
c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*d^2 - 4/1125*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^2*d^2 + 1/3*a^2*d^2*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^2 + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)
*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2
*d^2
```

Fricas [A] time = 1.90088, size = 697, normalized size = 2.25

$$\frac{3375\left(49a^2-2b^2\right)c^7d^2x^7-378\left(1225a^2-68b^2\right)c^5d^2x^5+35\left(11025a^2-818b^2\right)c^3d^2x^3-171780b^2cd^2x+11025\left(15b^2c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/1157625*(3375*(49*a^2 - 2*b^2)*c^7*d^2*x^7 - 378*(1225*a^2 - 68*b^2)*c^5*
d^2*x^5 + 35*(11025*a^2 - 818*b^2)*c^3*d^2*x^3 - 171780*b^2*c*d^2*x + 11025
*(15*b^2*c^7*d^2*x^7 - 42*b^2*c^5*d^2*x^5 + 35*b^2*c^3*d^2*x^3)*arcsin(c*x)
^2 + 22050*(15*a*b*c^7*d^2*x^7 - 42*a*b*c^5*d^2*x^5 + 35*a*b*c^3*d^2*x^3)*a
rcsin(c*x) + 210*(225*a*b*c^6*d^2*x^6 - 612*a*b*c^4*d^2*x^4 + 409*a*b*c^2*d
^2*x^2 + 818*a*b*d^2 + (225*b^2*c^6*d^2*x^6 - 612*b^2*c^4*d^2*x^4 + 409*b^2
*c^2*d^2*x^2 + 818*b^2*d^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] time = 19.8862, size = 483, normalized size = 1.56

$$\begin{cases}\frac{a^2c^4d^2x^7}{7}-\frac{2a^2c^2d^2x^5}{5}+\frac{a^2d^2x^3}{3}+\frac{2abc^4d^2x^7\operatorname{asin}(cx)}{7}+\frac{2abc^3d^2x^6\sqrt{-c^2x^2+1}}{49}-\frac{4abc^2d^2x^5\operatorname{asin}(cx)}{5}-\frac{136abcd^2x^4\sqrt{-c^2x^2+1}}{1225}+\frac{2abd^2x^3\operatorname{asin}(cx)}{3}+ \\ \frac{a^2d^2x^3}{3}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**7/7 - 2*a**2*c**2*d**2*x**5/5 + a**2*d**2*x**3
/3 + 2*a*b*c**4*d**2*x**7*asin(c*x)/7 + 2*a*b*c**3*d**2*x**6*sqrt(-c**2*x**
2 + 1)/49 - 4*a*b*c**2*d**2*x**5*asin(c*x)/5 - 136*a*b*c*d**2*x**4*sqrt(-c*
*2*x**2 + 1)/1225 + 2*a*b*d**2*x**3*asin(c*x)/3 + 818*a*b*d**2*x**2*sqrt(-c
**2*x**2 + 1)/(11025*c) + 1636*a*b*d**2*sqrt(-c**2*x**2 + 1)/(11025*c**3) +
 b**2*c**4*d**2*x**7*asin(c*x)**2/7 - 2*b**2*c**4*d**2*x**7/343 + 2*b**2*c*
*3*d**2*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/49 - 2*b**2*c**2*d**2*x**5*asin
(c*x)**2/5 + 136*b**2*c**2*d**2*x**5/6125 - 136*b**2*c*d**2*x**4*sqrt(-c**2
*x**2 + 1)*asin(c*x)/1225 + b**2*d**2*x**3*asin(c*x)**2/3 - 818*b**2*d**2*x
**3/33075 + 818*b**2*d**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(11025*c) - 1
636*b**2*d**2*x/(11025*c**2) + 1636*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x
)/(11025*c**3), Ne(c, 0)), (a**2*d**2*x**3/3, True))
```

Giac [B] time = 1.46981, size = 747, normalized size = 2.41

$$\frac{1}{7}\,a^2c^4d^2x^7-\frac{2}{5}\,a^2c^2d^2x^5+\frac{\left(c^2x^2-1\right)^3b^2d^2x\arcsin\left(cx\right)^2}{7\,c^2}+\frac{1}{3}\,a^2d^2x^3+\frac{2\left(c^2x^2-1\right)^3abd^2x\arcsin\left(cx\right)}{7\,c^2}+\frac{\left(c^2x^2-1\right)^2b^2}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/7*a^2*c^4*d^2*x^7 - 2/5*a^2*c^2*d^2*x^5 + 1/7*(c^2*x^2 - 1)^3*b^2*d^2*x*a
rcsin(c*x)^2/c^2 + 1/3*a^2*d^2*x^3 + 2/7*(c^2*x^2 - 1)^3*a*b*d^2*x*arcsin(c
*x)/c^2 + 1/35*(c^2*x^2 - 1)^2*b^2*d^2*x*arcsin(c*x)^2/c^2 - 2/343*(c^2*x^2
 - 1)^3*b^2*d^2*x/c^2 + 2/35*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x)/c^2 - 4/
105*(c^2*x^2 - 1)*b^2*d^2*x*arcsin(c*x)^2/c^2 + 2/49*(c^2*x^2 - 1)^3*sqrt(-
c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 202/42875*(c^2*x^2 - 1)^2*b^2*d^2*x/
c^2 - 8/105*(c^2*x^2 - 1)*a*b*d^2*x*arcsin(c*x)/c^2 + 8/105*b^2*d^2*x*arcsi
n(c*x)^2/c^2 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3 + 2/175*
(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 2528/1157625*(
c^2*x^2 - 1)*b^2*d^2*x/c^2 + 16/105*a*b*d^2*x*arcsin(c*x)/c^2 + 2/175*(c^2*
x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3 + 8/315*(-c^2*x^2 + 1)^(3/2)*b^2*
d^2*arcsin(c*x)/c^3 - 181456/1157625*b^2*d^2*x/c^2 + 8/315*(-c^2*x^2 + 1)^(
3/2)*a*b*d^2/c^3 + 16/105*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 16/1
05*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3
```

3.168 $\int x\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=209

$$\frac{bd^2x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{18c}+\frac{5bd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{72c}+\frac{5bd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{48c}-\frac{d^2\left(1-\right.}{}$$

```
[Out] (-25*b^2*d^2*x^2)/288 + (5*b^2*c^2*d^2*x^4)/288 + (b^2*d^2*(1 - c^2*x^2)^3)
/(108*c^2) + (5*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(48*c) + (5*
b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(72*c) + (b*d^2*x*(1 - c^2
*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(18*c) + (5*d^2*(a + b*ArcSin[c*x])^2)/(96
*c^2) - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(6*c^2)
```

Rubi [A] time = 0.197679, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {4677, 4649, 4647, 4641, 30, 14, 261}

$$\frac{bd^2x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{18c}+\frac{5bd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{72c}+\frac{5bd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{48c}-\frac{d^2\left(1-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-25*b^2*d^2*x^2)/288 + (5*b^2*c^2*d^2*x^4)/288 + (b^2*d^2*(1 - c^2*x^2)^3)
/(108*c^2) + (5*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(48*c) + (5*
b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(72*c) + (b*d^2*x*(1 - c^2
*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(18*c) + (5*d^2*(a + b*ArcSin[c*x])^2)/(96
*c^2) - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(6*c^2)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2\,dx = -\frac{d^2\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{6c^2}+\frac{\left(bd^2\right)\int\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,d$$

$$=\frac{bd^2x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{18c}-\frac{d^2\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{6c^2}-\frac{1}{18}$$

$$=\frac{b^2d^2\left(1-c^2x^2\right)^3}{108c^2}+\frac{5bd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{72c}+\frac{bd^2x\left(1-c^2x^2\right)^{5/2}}{18}$$

$$=\frac{b^2d^2\left(1-c^2x^2\right)^3}{108c^2}+\frac{5bd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{48c}+\frac{5bd^2x\left(1-c^2x^2\right)^{3/2}(}{72c}$$

$$=-\frac{25}{288}b^2d^2x^2+\frac{5}{288}b^2c^2d^2x^4+\frac{b^2d^2\left(1-c^2x^2\right)^3}{108c^2}+\frac{5bd^2x\sqrt{1-c^2x^2}\left(a+b\sin\right.}{48c}$$

Mathematica [A] time = 0.285541, size = 209, normalized size = 1.

$$\frac{d^2\left(cx\left(144a^2cx\left(c^4x^4-3c^2x^2+3\right)+6ab\sqrt{1-c^2x^2}\left(8c^4x^4-26c^2x^2+33\right)+b^2cx\left(-8c^4x^4+39c^2x^2-99\right)\right)+6b\sin^{-1}(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(c*x*(b^2*c*x*(-99 + 39*c^2*x^2 - 8*c^4*x^4) + 144*a^2*c*x*(3 - 3*c^2*
x^2 + c^4*x^4) + 6*a*b*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + 6
*b*(b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 3*a*(-11 + 48*c
^2*x^2 - 48*c^4*x^4 + 16*c^6*x^6))*ArcSin[c*x] + 9*b^2*(-11 + 48*c^2*x^2 -
48*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]^2))/(864*c^2)
```

Maple [A] time = 0.038, size = 283, normalized size = 1.4

$$\frac{1}{c^2}\left(d^2a^2\left(\frac{c^6x^6}{6}-\frac{c^4x^4}{2}+\frac{c^2x^2}{2}\right)+d^2b^2\left(\frac{(\arcsin(cx))^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)}{144}\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^2*(d^2*a^2*(1/6*c^6*x^6-1/2*c^4*x^4+1/2*c^2*x^2)+d^2*b^2*(1/6*arcsin(c*
x)^2*(c^2*x^2-1)^3+1/144*arcsin(c*x)*(8*c^5*x^5*(-c^2*x^2+1)^(1/2)-26*c^3*x
^3*(-c^2*x^2+1)^(1/2)+33*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-5/96*arcsin
(c*x)^2-1/108*(c^2*x^2-1)^3+5/288*(c^2*x^2-1)^2-5/96*c^2*x^2+5/96)+2*d^2*a*
b*(1/6*arcsin(c*x)*c^6*x^6-1/2*c^4*x^4*arcsin(c*x)+1/2*c^2*x^2*arcsin(c*x)+
1/36*c^5*x^5*(-c^2*x^2+1)^(1/2)-13/144*c^3*x^3*(-c^2*x^2+1)^(1/2)+11/96*c*x
*(-c^2*x^2+1)^(1/2)-11/96*arcsin(c*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{6}a^2c^4d^2x^6-\frac{1}{2}a^2c^2d^2x^4+\frac{1}{144}\left(48x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\arcsin}{\sqrt{c^2}c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*c^4*d^2*x^6 - 1/2*a^2*c^2*d^2*x^4 + 1/144*(48*x^6*arcsin(c*x) + (8*
sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x
^2 + 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*a*b*c^4*d^2
- 1/8*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2
+ 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*a*b*c^2*d^2 + 1/
2*a^2*d^2*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcs
in(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^2)))*a*b*d^2 + 1/6*(b^2*c^4*d^2*x^6 - 3*b^
2*c^2*d^2*x^4 + 3*b^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
 + integrate(1/3*(b^2*c^5*d^2*x^6 - 3*b^2*c^3*d^2*x^4 + 3*b^2*c*d^2*x^2)*sq
rt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*
x^2 - 1), x)
```

Fricas [A] time = 1.80314, size = 609, normalized size = 2.91

$$\frac{8\left(18a^2-b^2\right)c^6d^2x^6-3\left(144a^2-13b^2\right)c^4d^2x^4+9\left(48a^2-11b^2\right)c^2d^2x^2+9\left(16b^2c^6d^2x^6-48b^2c^4d^2x^4+48b^2c^2d^2x^2-1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/864*(8*(18*a^2 - b^2)*c^6*d^2*x^6 - 3*(144*a^2 - 13*b^2)*c^4*d^2*x^4 + 9*
(48*a^2 - 11*b^2)*c^2*d^2*x^2 + 9*(16*b^2*c^6*d^2*x^6 - 48*b^2*c^4*d^2*x^4
+ 48*b^2*c^2*d^2*x^2 - 11*b^2*d^2)*arcsin(c*x)^2 + 18*(16*a*b*c^6*d^2*x^6 -
```

```
48*a*b*c^4*d^2*x^4 + 48*a*b*c^2*d^2*x^2 - 11*a*b*d^2)*arcsin(c*x) + 6*(8*a
*b*c^5*d^2*x^5 - 26*a*b*c^3*d^2*x^3 + 33*a*b*c*d^2*x + (8*b^2*c^5*d^2*x^5 -
26*b^2*c^3*d^2*x^3 + 33*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] time = 13.7133, size = 430, normalized size = 2.06

$$\begin{cases} \frac{a^2c^4d^2x^6}{6} - \frac{a^2c^2d^2x^4}{2} + \frac{a^2d^2x^2}{2} + \frac{abc^4d^2x^6 \operatorname{asin}(cx)}{3} + \frac{abc^3d^2x^5\sqrt{-c^2x^2+1}}{18} - abc^2d^2x^4 \operatorname{asin}(cx) - \frac{13abcd^2x^3\sqrt{-c^2x^2+1}}{72} + abd^2x^2 \operatorname{asin}(\\ \frac{a^2d^2x^2}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**6/6 - a**2*c**2*d**2*x**4/2 + a**2*d**2*x**2/2
 + a*b*c**4*d**2*x**6*asin(c*x)/3 + a*b*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)
/18 - a*b*c**2*d**2*x**4*asin(c*x) - 13*a*b*c*d**2*x**3*sqrt(-c**2*x**2 + 1
)/72 + a*b*d**2*x**2*asin(c*x) + 11*a*b*d**2*x*sqrt(-c**2*x**2 + 1)/(48*c)
- 11*a*b*d**2*asin(c*x)/(48*c**2) + b**2*c**4*d**2*x**6*asin(c*x)**2/6 - b*
*2*c**4*d**2*x**6/108 + b**2*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/
18 - b**2*c**2*d**2*x**4*asin(c*x)**2/2 + 13*b**2*c**2*d**2*x**4/288 - 13*b
**2*c*d**2*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/72 + b**2*d**2*x**2*asin(c*x
)**2/2 - 11*b**2*d**2*x**2/96 + 11*b**2*d**2*x*sqrt(-c**2*x**2 + 1)*asin(c*
x)/(48*c) - 11*b**2*d**2*asin(c*x)**2/(96*c**2), Ne(c, 0)), (a**2*d**2*x**2
/2, True))
```

Giac [A] time = 1.48457, size = 482, normalized size = 2.31

$$\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}b^2d^2x \arcsin(cx)}{18c} + \frac{\left(c^2x^2-1\right)^3b^2d^2 \arcsin(cx)^2}{6c^2} + \frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}abd^2x}{18c} + \frac{5\left(-c^2x^2+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c + 1/6*(c^2*
x^2 - 1)^3*b^2*d^2*arcsin(c*x)^2/c^2 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 +
 1)*a*b*d^2*x/c + 5/72*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*x*arcsin(c*x)/c + 1/3*(
c^2*x^2 - 1)^3*a*b*d^2*arcsin(c*x)/c^2 + 5/72*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*
x/c + 5/48*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c + 1/6*(c^2*x^2 - 1)^3
*a^2*d^2/c^2 - 1/108*(c^2*x^2 - 1)^3*b^2*d^2/c^2 + 5/48*sqrt(-c^2*x^2 + 1)*
a*b*d^2*x/c + 5/288*(c^2*x^2 - 1)^2*b^2*d^2/c^2 + 5/96*b^2*d^2*arcsin(c*x)^
2/c^2 - 5/96*(c^2*x^2 - 1)*b^2*d^2/c^2 + 5/48*a*b*d^2*arcsin(c*x)/c^2 - 245
/6912*b^2*d^2/c^2
```

3.169 $\int \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=219

$$\frac{1}{5}d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{4}{15}d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{25c}+\frac{8bd^2(1$$

```
[Out] (-298*b^2*d^2*x)/225 + (76*b^2*c^2*d^2*x^3)/675 - (2*b^2*c^4*d^2*x^5)/125 +
 (16*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(15*c) + (8*b*d^2*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(25*c) + (8*d^2*x*(a + b*ArcSin[c*x])^2)/15 + (4*d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/15 + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSi
n[c*x])^2)/5
```

Rubi [A] time = 0.255607, antiderivative size = 219, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4649, 4619, 4677, 8, 194}

$$\frac{1}{5}d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{4}{15}d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{25c}+\frac{8bd^2(1$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-298*b^2*d^2*x)/225 + (76*b^2*c^2*d^2*x^3)/675 - (2*b^2*c^4*d^2*x^5)/125 +
 (16*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(15*c) + (8*b*d^2*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(25*c) + (8*d^2*x*(a + b*ArcSin[c*x])^2)/15 + (4*d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/15 + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSi
n[c*x])^2)/5
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
```

```
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{5}d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{5}(4d)\int \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2$$

$$= \frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{25c}+\frac{4}{15}d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{5}$$

$$= \frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{45c}+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{25c}+$$

$$= -\frac{58}{225}b^2d^2x+\frac{76}{675}b^2c^2d^2x^3-\frac{2}{125}b^2c^4d^2x^5+\frac{16bd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{15c}$$

$$= -\frac{298}{225}b^2d^2x+\frac{76}{675}b^2c^2d^2x^3-\frac{2}{125}b^2c^4d^2x^5+\frac{16bd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{15c}$$

Mathematica [A] time = 0.257989, size = 193, normalized size = 0.88

$$d^2\left(225a^2cx\left(3c^4x^4-10c^2x^2+15\right)+30ab\sqrt{1-c^2x^2}\left(9c^4x^4-38c^2x^2+149\right)+30b\sin^{-1}(cx)\left(15acx\left(3c^4x^4-10c^2x^2+\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(225*a^2*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 30*a*b*Sqrt[1 - c^2*x^2]*
(149 - 38*c^2*x^2 + 9*c^4*x^4) - 2*b^2*c*x*(2235 - 190*c^2*x^2 + 27*c^4*x^4
) + 30*b*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(149
 - 38*c^2*x^2 + 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*c*x*(15 - 10*c^2*x^2 + 3*
c^4*x^4)*ArcSin[c*x]^2))/(3375*c)
```

Maple [A] time = 0.037, size = 275, normalized size = 1.3

$$\frac{1}{c}\left(d^2a^2\left(\frac{c^5x^5}{5}-\frac{2c^3x^3}{3}+cx\right)+d^2b^2\left(\frac{(\arcsin(cx))^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}-\frac{16cx}{15}+\frac{16\arcsin(cx)}{15}\sqrt{-c^2x^2+1}+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(d^2*a^2*(1/5*c^5*x^5-2/3*c^3*x^3+c*x)+d^2*b^2*(1/15*arcsin(c*x)^2*(3*c
^4*x^4-10*c^2*x^2+15)*c*x-16/15*c*x+16/15*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/
```

```
25*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)-2/375*(3*c^4*x^4-10*c^2*x^2
+15)*c*x-8/45*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+8/135*(c^2*x^2-3)*
c*x)+2*d^2*a*b*(1/5*arcsin(c*x)*c^5*x^5-2/3*c^3*x^3*arcsin(c*x)+c*x*arcsin(
c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-38/225*c^2*x^2*(-c^2*x^2+1)^(1/2)+149/
225*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.75827, size = 628, normalized size = 2.87

$$\frac{1}{5}b^2c^4d^2x^5\arcsin(cx)^2+\frac{1}{5}a^2c^4d^2x^5-\frac{2}{3}b^2c^2d^2x^3\arcsin(cx)^2+\frac{2}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+}}{c^4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*c^4*d^2*x^5*arcsin(c*x)^2 + 1/5*a^2*c^4*d^2*x^5 - 2/3*b^2*c^2*d^2*x
^3*arcsin(c*x)^2 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^4*d^2
+ 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 +
 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)
/c^4)*b^2*c^4*d^2 - 2/3*a^2*c^2*d^2*x^3 - 4/9*(3*x^3*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d^2 - 4/27*(3*c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*
x^3 + 6*x)/c^2)*b^2*c^2*d^2 + b^2*d^2*x*arcsin(c*x)^2 - 2*b^2*d^2*(x - sqrt
(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*a*b*d^2/c
```

Fricas [A] time = 1.87606, size = 560, normalized size = 2.56

$$\frac{27\left(25a^2-2b^2\right)c^5d^2x^5-10\left(225a^2-38b^2\right)c^3d^2x^3+15\left(225a^2-298b^2\right)cd^2x+225\left(3b^2c^5d^2x^5-10b^2c^3d^2x^3+15b^2cd\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/3375*(27*(25*a^2 - 2*b^2)*c^5*d^2*x^5 - 10*(225*a^2 - 38*b^2)*c^3*d^2*x^3
 + 15*(225*a^2 - 298*b^2)*c*d^2*x + 225*(3*b^2*c^5*d^2*x^5 - 10*b^2*c^3*d^2
*x^3 + 15*b^2*c*d^2*x)*arcsin(c*x)^2 + 450*(3*a*b*c^5*d^2*x^5 - 10*a*b*c^3*
d^2*x^3 + 15*a*b*c*d^2*x)*arcsin(c*x) + 30*(9*a*b*c^4*d^2*x^4 - 38*a*b*c^2*
d^2*x^2 + 149*a*b*d^2 + (9*b^2*c^4*d^2*x^4 - 38*b^2*c^2*d^2*x^2 + 149*b^2*d
^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] time = 7.15306, size = 389, normalized size = 1.78

$$\begin{cases}\frac{a^2c^4d^2x^5}{5}-\frac{2a^2c^2d^2x^3}{3}+a^2d^2x+\frac{2abc^4d^2x^5\operatorname{asin}(cx)}{5}+\frac{2abc^3d^2x^4\sqrt{-c^2x^2+1}}{25}-\frac{4abc^2d^2x^3\operatorname{asin}(cx)}{3}-\frac{76abcd^2x^2\sqrt{-c^2x^2+1}}{225}+2abd^2x\operatorname{asin}(cx)\\ a^2d^2x\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**5/5 - 2*a**2*c**2*d**2*x**3/3 + a**2*d**2*x +
2*a*b*c**4*d**2*x**5*asin(c*x)/5 + 2*a*b*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1
)/25 - 4*a*b*c**2*d**2*x**3*asin(c*x)/3 - 76*a*b*c*d**2*x**2*sqrt(-c**2*x**
2 + 1)/225 + 2*a*b*d**2*x*asin(c*x) + 298*a*b*d**2*sqrt(-c**2*x**2 + 1)/(22
5*c) + b**2*c**4*d**2*x**5*asin(c*x)**2/5 - 2*b**2*c**4*d**2*x**5/125 + 2*b
**2*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/25 - 2*b**2*c**2*d**2*x**
3*asin(c*x)**2/3 + 76*b**2*c**2*d**2*x**3/675 - 76*b**2*c*d**2*x**2*sqrt(-c
**2*x**2 + 1)*asin(c*x)/225 + b**2*d**2*x*asin(c*x)**2 - 298*b**2*d**2*x/22
5 + 298*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*c), Ne(c, 0)), (a**2*
d**2*x, True))
```

Giac [A] time = 1.44649, size = 505, normalized size = 2.31

$$\frac{1}{5}\,a^2c^4d^2x^5 - \frac{2}{3}\,a^2c^2d^2x^3 + \frac{1}{5}\left(c^2x^2-1\right)^2 b^2d^2x\arcsin\left(cx\right)^2 + \frac{2}{5}\left(c^2x^2-1\right)^2 abd^2x\arcsin\left(cx\right) - \frac{4}{15}\left(c^2x^2-1\right)b^2d^2x\,\mathrm{arcs}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/5*a^2*c^4*d^2*x^5 - 2/3*a^2*c^2*d^2*x^3 + 1/5*(c^2*x^2 - 1)^2*b^2*d^2*x*a
rcsin(c*x)^2 + 2/5*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x) - 4/15*(c^2*x^2 -
1)*b^2*d^2*x*arcsin(c*x)^2 - 2/125*(c^2*x^2 - 1)^2*b^2*d^2*x - 8/15*(c^2*x^
2 - 1)*a*b*d^2*x*arcsin(c*x) + 8/15*b^2*d^2*x*arcsin(c*x)^2 + 2/25*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c + 272/3375*(c^2*x^2 - 1)*b
^2*d^2*x + 16/15*a*b*d^2*x*arcsin(c*x) + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
 + 1)*a*b*d^2/c + 8/45*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*arcsin(c*x)/c + a^2*d^2
*x - 4144/3375*b^2*d^2*x + 8/45*(-c^2*x^2 + 1)^(3/2)*a*b*d^2/c + 16/15*sqrt
(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c + 16/15*sqrt(-c^2*x^2 + 1)*a*b*d^2/c
```

3.170 $\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx))^2}{x}\,dx$

Optimal. Leaf size=271

$$-ibd^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}b^2d^2\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)$$

```
[Out] (13*b^2*c^2*d^2*x^2)/32 - (b^2*c^4*d^2*x^4)/32 - (11*b*c*d^2*x*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x]))/16 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/8 - (11*d^2*(a + b*ArcSin[c*x])^2)/32 + (d^2*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/2 + (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - ((I/3)*
d^2*(a + b*ArcSin[c*x])^3)/b + d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*A
rcSin[c*x])] - I*b*d^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])
] + (b^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rubi [A] time = 0.41496, antiderivative size = 271, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4699, 4625, 3717, 2190, 2531, 2282, 6589, 4647, 4641, 30, 4649, 14}

$$-ibd^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}b^2d^2\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x,x]
```


```
[Out] (13*b^2*c^2*d^2*x^2)/32 - (b^2*c^4*d^2*x^4)/32 - (11*b*c*d^2*x*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x]))/16 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/8 - (11*d^2*(a + b*ArcSin[c*x])^2)/32 + (d^2*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/2 + (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - ((I/3)*
d^2*(a + b*ArcSin[c*x])^3)/b + d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*A
rcSin[c*x])] - I*b*d^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])
] + (b^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
```

```
x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
```

```
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \frac{1}{4}d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+d\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx-\frac{1}{2}\left(b\right.$$

$$= -\frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{4}d^2$$

$$= -\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}$$

$$= \frac{13}{32}b^2c^2d^2x^2-\frac{1}{32}b^2c^4d^2x^4-\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{8}bcd^2x\left(1-c^2\right.$$

$$= \frac{13}{32}b^2c^2d^2x^2-\frac{1}{32}b^2c^4d^2x^4-\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{8}bcd^2x\left(1-c^2\right.$$

$$= \frac{13}{32}b^2c^2d^2x^2-\frac{1}{32}b^2c^4d^2x^4-\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{8}bcd^2x\left(1-c^2\right.$$

$$= \frac{13}{32}b^2c^2d^2x^2-\frac{1}{32}b^2c^4d^2x^4-\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{8}bcd^2x\left(1-c^2\right.$$

$$= \frac{13}{32}b^2c^2d^2x^2-\frac{1}{32}b^2c^4d^2x^4-\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{8}bcd^2x\left(1-c^2\right.$$

Mathematica [A] time = 0.478867, size = 353, normalized size = 1.3

$$\frac{1}{768}d^2\left(-768iab\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+768ib^2\sin^{-1}(cx)\text{PolyLog}\left(2,e^{-2i\sin^{-1}(cx)}\right)+384b^2\text{PolyLog}\left(3,e^{-2i\sin^{-1}(cx)}\right)+\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^2*((-32*I)*b^2*Pi^3 - 768*a^2*c^2*x^2 + 192*a^2*c^4*x^4 - 624*a*b*c*x*Sq
rt[1 - c^2*x^2] + 96*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 624*a*b*ArcSin[c*x] -
1536*a*b*c^2*x^2*ArcSin[c*x] + 384*a*b*c^4*x^4*ArcSin[c*x] - (768*I)*a*b*Ar
cSin[c*x]^2 + (256*I)*b^2*ArcSin[c*x]^3 - 144*b^2*Cos[2*ArcSin[c*x]] + 288*
b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 3*b^2*Cos[4*ArcSin[c*x]] + 24*b^2*Ar
cSin[c*x]^2*Cos[4*ArcSin[c*x]] + 768*b^2*ArcSin[c*x]^2*Log[1 - E^((-2*I)*Ar
cSin[c*x])] + 1536*a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 768*a^2
*Log[c*x] + (768*I)*b^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (7
68*I)*a*b*PolyLog[2, E^((2*I)*ArcSin[c*x])] + 384*b^2*PolyLog[3, E^((-2*I)*
ArcSin[c*x])] - 288*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - 12*b^2*ArcSin[c*x]
*Sin[4*ArcSin[c*x]]))/768
```

Maple [B] time = 0.307, size = 623, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] -13/16*d^2*a*b*(-c^2*x^2+1)^(1/2)*c*x+1/8*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*c^3*x^3-13/16*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x+1/2*d^2*a*b*
arcsin(c*x)*c^4*x^4-2*d^2*a*b*arcsin(c*x)*c^2*x^2+1/8*d^2*a*b*(-c^2*x^2+1)^
(1/2)*c^3*x^3-49/256*d^2*b^2+13/32*b^2*c^2*d^2*x^2-1/32*b^2*c^4*d^2*x^4+1/4
*d^2*a^2*c^4*x^4-d^2*a^2*c^2*x^2+13/16*d^2*a*b*arcsin(c*x)+d^2*b^2*arcsin(c
*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+d^2*b^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2
*x^2+1)^(1/2))-1/3*I*d^2*b^2*arcsin(c*x)^3+d^2*a^2*ln(c*x)+13/32*d^2*b^2*ar
csin(c*x)^2+2*d^2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*d^2*b^2*polylog
(3,-I*c*x-(-c^2*x^2+1)^(1/2))+1/4*d^2*b^2*arcsin(c*x)^2*c^4*x^4-d^2*b^2*arc
sin(c*x)^2*c^2*x^2+2*d^2*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*d
^2*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*d^2*a*b*polylog(2,-I*
c*x-(-c^2*x^2+1)^(1/2))-2*I*d^2*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-I*d
^2*a*b*arcsin(c*x)^2-2*I*d^2*b^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(
1/2))-2*I*d^2*b^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}a^2c^4d^2x^4 - a^2c^2d^2x^2 + a^2d^2\log(x) + \int \frac{\left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)^2 + 2\left(abc^4d^2\right.}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] 1/4*a^2*c^4*d^2*x^4 - a^2*c^2*d^2*x^2 + a^2*d^2*log(x) + integrate(((b^2*c^
4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin(cx)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + ab\right.}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int \frac{a^2}{x}\,dx + \int -2a^2c^2x\,dx + \int a^2c^4x^3\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{x}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{x}\,dx + \int -2b^2c^2x\operatorname{asin}^2(cx)\,dx + \int b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x,x)
```

```
[Out] d**2*(Integral(a**2/x, x) + Integral(-2*a**2*c**2*x, x) + Integral(a**2*c**
4*x**3, x) + Integral(b**2*asin(c*x)**2/x, x) + Integral(2*a*b*asin(c*x)/x,
 x) + Integral(-2*b**2*c**2*x*asin(c*x)**2, x) + Integral(b**2*c**4*x**3*as
in(c*x)**2, x) + Integral(-4*a*b*c**2*x*asin(c*x), x) + Integral(2*a*b*c**4
*x**3*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2 - d\right)^2 (b\arcsin(cx) + a)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x, x)
```

3.171 $\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=249

$$2ib^2cd^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-2ib^2cd^2\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\frac{4}{3}c^2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2-\frac{2}{9}bcd^2\left(1-\right.$$

```
[Out] (32*b^2*c^2*d^2*x)/9 - (2*b^2*c^4*d^2*x^3)/27 - (10*b*c*d^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/3 - (2*b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/9 - (8*c^2*d^2*x*(a + b*ArcSin[c*x])^2)/3 - (4*c^2*d^2*x*(1 - c^2*x^2)
*(a + b*ArcSin[c*x])^2)/3 - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/x -
 4*b*c*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^2
*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^2*PolyLog[2, E^(I*ArcSin[c*
x])]
```

Rubi [A] time = 0.493218, antiderivative size = 249, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4695, 4649, 4619, 4677, 8, 4699, 4697, 4709, 4183, 2279, 2391}

$$2ib^2cd^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-2ib^2cd^2\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\frac{4}{3}c^2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2-\frac{2}{9}bcd^2\left(1-\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^2,x]
```


```
[Out] (32*b^2*c^2*d^2*x)/9 - (2*b^2*c^4*d^2*x^3)/27 - (10*b*c*d^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/3 - (2*b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/9 - (8*c^2*d^2*x*(a + b*ArcSin[c*x])^2)/3 - (4*c^2*d^2*x*(1 - c^2*x^2)
*(a + b*ArcSin[c*x])^2)/3 - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/x -
 4*b*c*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^2
*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^2*PolyLog[2, E^(I*ArcSin[c*
x])]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^2}dx = -\frac{d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x} - \left(4c^2d\right)\int\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2 d$$

$$= \frac{2}{3}bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2 -$$

$$= -\frac{2}{3}b^2c^2d^2x + \frac{2}{9}b^2c^4d^2x^3 + 2bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}bcd^2\left(1-c^2x^2\right.$$

$$= -\frac{16}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}bcd^2\left(1-\right.$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}bcd^2\left(1-c^2\right.$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}bcd^2\left(1-c^2\right.$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}bcd^2\left(1-c^2\right.$$

Mathematica [A] time = 1.03038, size = 322, normalized size = 1.29

$$\frac{1}{54}d^2\left(108ib^2c\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right) - 108ib^2c\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right) + 18a^2c^4x^3 - 108a^2c^2x - \frac{54a^2}{x} + 12abc\sqrt{1-c}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^2*((-54*a^2)/x - 108*a^2*c^2*x + 18*a^2*c^4*x^3 + 12*a*b*c*Sqrt[1 - c^2*
x^2]*(2 + c^2*x^2) + 36*a*b*c^4*x^3*ArcSin[c*x] - 189*b^2*c*Sqrt[1 - c^2*x^
2]*ArcSin[c*x] - 216*a*b*c*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) - 108*b^2*
c^2*x*(-2 + ArcSin[c*x]^2) + 2*b^2*c^2*x*(-2*(6 + c^2*x^2) + 9*c^2*x^2*ArcS
in[c*x]^2) - (108*a*b*(ArcSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]))/x - 3
*b^2*c*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - (54*b^2*ArcSin[c*x]*(ArcSin[c*x] +
2*c*x*(-Log[1 - E^(I*ArcSin[c*x])] + Log[1 + E^(I*ArcSin[c*x])])))/x + (108
*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])] - (108*I)*b^2*c*PolyLog[2, E^(I*Ar
cSin[c*x])]))/54
```

Maple [A] time = 0.257, size = 417, normalized size = 1.7

$$\frac{d^2a^2c^4x^3}{3} - 2d^2a^2c^2x - \frac{d^2a^2}{x} - \frac{2b^2c^4d^2x^3}{27} + \frac{32b^2c^2d^2x}{9} + \frac{2d^2b^2\arcsin(cx)c^3x^2}{9}\sqrt{-c^2x^2+1} + 2ib^2cd^2\text{polylog}\left(2,-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] 1/3*d^2*a^2*c^4*x^3-2*d^2*a^2*c^2*x-d^2*a^2/x-2/27*b^2*c^4*d^2*x^3+32/9*b^2
*c^2*d^2*x+2/9*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^2+2*I*b^2*c*d^2
*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*c*d^2*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))-d^2*b^2/x*arcsin(c*x)^2-2*c*d^2*b^2*arcsin(c*x)*ln(1+I*c*x+(-c
^2*x^2+1)^(1/2))+2*c*d^2*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/3
*d^2*b^2*arcsin(c*x)^2*c^4*x^3-2*d^2*b^2*arcsin(c*x)^2*c^2*x-32/9*c*d^2*b^2
*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/3*d^2*a*b*c^4*x^3*arcsin(c*x)-4*d^2*a*b*c
^2*x*arcsin(c*x)-2*d^2*a*b/x*arcsin(c*x)+2/9*d^2*a*b*c^3*x^2*(-c^2*x^2+1)^(
1/2)-32/9*c*d^2*a*b*(-c^2*x^2+1)^(1/2)-2*c*d^2*a*b*arctanh(1/(-c^2*x^2+1)^(
1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}a^2c^4d^2x^3 + \frac{2}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abc^4d^2 - 2b^2c^2d^2x\arcsin(cx)^2 + 4b^2c^2d^2\left(x - \frac{\sqrt{-}\cdots}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^2*c^4*d^2*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^4*d^2 - 2*b^2*c^2*d^2*x*arcsin(c*x)^2
+ 4*b^2*c^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) - 2*a^2*c^2*d^2*x -
4*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d^2 - 2*(c*log(2*sqrt(-c^2*x
^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d^2 - a^2*d^2/x + 1/3*((b^2
*c^4*d^2*x^4 - 3*b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 3*
x*integrate(2/3*(b^2*c^5*d^2*x^4 - 3*b^2*c*d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^3 - x), x))/x
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{a^2c^4d^2x^4 - 2a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2b^2c^2d^2x^2 + b^2d^2\right)\arcsin(cx)^2 + 2\left(abc^4d^2x^4 - 2abc^2d^2x^2 + abd^2\right)\cdots}{x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int -2a^2c^2\,dx + \int \frac{a^2}{x^2}\,dx + \int a^2c^4x^2\,dx + \int -2b^2c^2\operatorname{asin}^2(cx)\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{x^2}\,dx + \int -4abc^2\operatorname{asin}(cx)\,dx + \int \cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] d**2*(Integral(-2*a**2*c**2, x) + Integral(a**2/x**2, x) + Integral(a**2*c*
*4*x**2, x) + Integral(-2*b**2*c**2*asin(c*x)**2, x) + Integral(b**2*asin(c
*x)**2/x**2, x) + Integral(-4*a*b*c**2*asin(c*x), x) + Integral(2*a*b*asin(
c*x)/x**2, x) + Integral(b**2*c**4*x**2*asin(c*x)**2, x) + Integral(2*a*b*c
**4*x**2*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

3.172 $\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=287

$$2ibc^2d^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-b^2c^2d^2\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)$$

```
[Out] -(b^2*c^4*d^2*x^2)/4 - (b*c^3*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
2 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x - (c^2*d^2*(a + b*A
rcSin[c*x])^2)/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2 - (d^2*(1 -
c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*x^2) + (((2*I)/3)*c^2*d^2*(a + b*ArcSi
n[c*x])^3)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*x]
)] + b^2*c^2*d^2*Log[x] + (2*I)*b*c^2*d^2*(a + b*ArcSin[c*x])*PolyLog[2, E^
((2*I)*ArcSin[c*x])] - b^2*c^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.474914, antiderivative size = 287, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4695, 4699, 4625, 3717, 2190, 2531, 2282, 6589, 4647, 4641, 30, 14}

$$2ibc^2d^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-b^2c^2d^2\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^3,x]
```


```
[Out] -(b^2*c^4*d^2*x^2)/4 - (b*c^3*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
2 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x - (c^2*d^2*(a + b*A
rcSin[c*x])^2)/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2 - (d^2*(1 -
c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*x^2) + (((2*I)/3)*c^2*d^2*(a + b*ArcSi
n[c*x])^3)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*x]
)] + b^2*c^2*d^2*Log[x] + (2*I)*b*c^2*d^2*(a + b*ArcSin[c*x])*PolyLog[2, E^
((2*I)*ArcSin[c*x])] - b^2*c^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
```

```
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx = -\frac{d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} - \left(2c^2d\right)\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx +$$

$$= -\frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x} - c^2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d^2\left(1-\right.}{}$$

$$= -\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x} - c^2d$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.}{x}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.}{x}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.}{x}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.}{x}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.}{x}$$

Mathematica [A] time = 0.881177, size = 343, normalized size = 1.2

$$\frac{1}{2}d^2\left(4iabc^2\left(\sin^{-1}(cx)^2+\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right)+\frac{1}{6}ib^2c^2\left(-24\sin^{-1}(cx)\text{PolyLog}\left(2,e^{-2i\sin^{-1}(cx)}\right)+12i\text{PolyLog}\left(3,e\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d^2*(-(a^2/x^2) + a^2*c^4*x^2 + a*b*c^2*(c*x*Sqrt[1 - c^2*x^2] - ArcSin[c*
x]) + 2*a*b*c^4*x^2*ArcSin[c*x] - (2*a*b*(c*x*Sqrt[1 - c^2*x^2] + ArcSin[c*
x]))/x^2 - (b^2*c^2*(-1 + 2*ArcSin[c*x]^2)*Cos[2*ArcSin[c*x]])/4 - 8*a*b*c^
2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - 4*a^2*c^2*Log[x] - (b^2*(2*c
*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 2*c^2*x^2*Log[c*x]))/x^2
 + (4*I)*a*b*c^2*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])]) + (I/6
)*b^2*c^2*(Pi^3 - 8*ArcSin[c*x]^3 + (24*I)*ArcSin[c*x]^2*Log[1 - E^((-2*I)*
ArcSin[c*x])] - 24*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (12*I)*
PolyLog[3, E^((-2*I)*ArcSin[c*x])]) + (b^2*c^2*ArcSin[c*x]*Sin[2*ArcSin[c*x
]])/2))/2
```

Maple [B] time = 0.525, size = 767, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x)
```

```
[Out] 1/8*d^2*b^2*c^2-1/2*d^2*a^2/x^2+c^2*d^2*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+
c^2*d^2*b^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*c^2*d^2*b^2*ln(I*c*x+(-c^2*x^2
+1)^(1/2))-2*c^2*d^2*a^2*ln(c*x)-1/4*c^2*d^2*b^2*arcsin(c*x)^2-4*c^2*d^2*b^
2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-4*c^2*d^2*b^2*polylog(3,-I*c*x-(-c^2*
x^2+1)^(1/2))-1/2*d^2*b^2*arcsin(c*x)^2/x^2+1/2*c^4*d^2*a^2*x^2-1/4*b^2*c^4
*d^2*x^2+2*I*c^2*d^2*a*b*arcsin(c*x)^2+4*I*c^2*d^2*a*b*polylog(2,-I*c*x-(-c
^2*x^2+1)^(1/2))+4*I*c^2*d^2*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+4*I*c^
2*d^2*b^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+4*I*c^2*d^2*b^2*
arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/2*c^3*d^2*a*b*(-c^2*x^2+1
)^(1/2)*x+1/2*c^3*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x+c^4*d^2*a*b*arcs
in(c*x)*x^2-c*d^2*b^2*arcsin(c*x)/x*(-c^2*x^2+1)^(1/2)-c*d^2*a*b/x*(-c^2*x^
2+1)^(1/2)-4*c^2*d^2*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-4*c^2*d
^2*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-d^2*a*b*arcsin(c*x)/x^2+I
*c^2*d^2*a*b+I*c^2*d^2*b^2*arcsin(c*x)-1/2*c^2*d^2*a*b*arcsin(c*x)-2*c^2*d^
2*b^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*c^2*d^2*b^2*arcsin(c*x
)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/2*c^4*d^2*b^2*arcsin(c*x)^2*x^2+2/3*I*
c^2*d^2*b^2*arcsin(c*x)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^2c^4d^2x^2 - 2a^2c^2d^2\log(x) - abd^2\left(\frac{\sqrt{-c^2x^2+1}c}{x} + \frac{\arcsin(cx)}{x^2}\right) - \frac{a^2d^2}{2x^2} + \int \frac{\left(b^2c^4d^2x^4 - 2b^2c^2d^2x^2 + b^2d^2\right)\arctan$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*c^4*d^2*x^2 - 2*a^2*c^2*d^2*log(x) - a*b*d^2*(sqrt(-c^2*x^2 + 1)*c/
x + arcsin(c*x)/x^2) - 1/2*a^2*d^2/x^2 + integrate(((b^2*c^4*d^2*x^4 - 2*b^
2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(
a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{a^2c^4d^2x^4 - 2a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2b^2c^2d^2x^2 + b^2d^2\right)\arcsin(cx)^2 + 2\left(abc^4d^2x^4 - 2abc^2d^2x^2 + al\right.}{x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
```

```
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int \frac{a^2}{x^3}\,dx + \int -\frac{2a^2c^2}{x}\,dx + \int a^2c^4x\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{x^3}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{x^3}\,dx + \int -\frac{2b^2c^2\operatorname{asin}^2(cx)}{x}\,dx + \int b^2c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] d**2*(Integral(a**2/x**3, x) + Integral(-2*a**2*c**2/x, x) + Integral(a**2*
c**4*x, x) + Integral(b**2*asin(c*x)**2/x**3, x) + Integral(2*a*b*asin(c*x)
/x**3, x) + Integral(-2*b**2*c**2*asin(c*x)**2/x, x) + Integral(b**2*c**4*x
*asin(c*x)**2, x) + Integral(-4*a*b*c**2*asin(c*x)/x, x) + Integral(2*a*b*c
**4*x*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2 - d\right)^2 (b\arcsin(cx) + a)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x^3, x)
```

3.173 $\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx$

Optimal. Leaf size=268

$$-\frac{11}{3}ib^2c^3d^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+\frac{11}{3}ib^2c^3d^2\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{4c^2d^2}{}$$

```
[Out] -(b^2*c^2*d^2)/(3*x) - 2*b^2*c^4*d^2*x + (5*b*c^3*d^2*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*
x^2) + (8*c^4*d^2*x*(a + b*ArcSin[c*x])^2)/3 + (4*c^2*d^2*(1 - c^2*x^2)*(a
+ b*ArcSin[c*x])^2)/(3*x) - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*
x^3) + (22*b*c^3*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((
11*I)/3)*b^2*c^3*d^2*PolyLog[2, -E^(I*ArcSin[c*x])] + ((11*I)/3)*b^2*c^3*d^
2*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rubi [A] time = 0.675485, antiderivative size = 268, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.37, Rules used = {4695, 4619, 4677, 8, 4697, 4709, 4183, 2279, 2391, 14}

$$-\frac{11}{3}ib^2c^3d^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+\frac{11}{3}ib^2c^3d^2\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{4c^2d^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^4,x]
```


```
[Out] -(b^2*c^2*d^2)/(3*x) - 2*b^2*c^4*d^2*x + (5*b*c^3*d^2*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*
x^2) + (8*c^4*d^2*x*(a + b*ArcSin[c*x])^2)/3 + (4*c^2*d^2*(1 - c^2*x^2)*(a
+ b*ArcSin[c*x])^2)/(3*x) - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*
x^3) + (22*b*c^3*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((
11*I)/3)*b^2*c^3*d^2*PolyLog[2, -E^(I*ArcSin[c*x])] + ((11*I)/3)*b^2*c^3*d^
2*PolyLog[2, E^(I*ArcSin[c*x])]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
```

```
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx = -\frac{d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{3x^3} - \frac{1}{3}\left(4c^2d\right)\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^{\cdots}}{x^2}$$

$$= -\frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} + \frac{4c^2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3x} - \cdots$$

$$= -\frac{11}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} + \cdots$$

$$= -\frac{b^2c^2d^2}{3x} + \frac{10}{3}b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3\cdots}}{\cdots}$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}}{3x\cdots}$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}}{3x\cdots}$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}}{3x\cdots}$$

Mathematica [A] time = 0.82151, size = 374, normalized size = 1.4

$$\frac{d^2\left(-11ib^2c^3x^3\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+11ib^2c^3x^3\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+3a^2c^4x^4+6a^2c^2x^2-a^2+6abc^3x^3\sqrt{1-c\cdots}\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d^2*(-a^2 + 6*a^2*c^2*x^2 - b^2*c^2*x^2 + 3*a^2*c^4*x^4 - 6*b^2*c^4*x^4 -
a*b*c*x*Sqrt[1 - c^2*x^2] + 6*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] - 2*a*b*ArcSin[
c*x] + 12*a*b*c^2*x^2*ArcSin[c*x] + 6*a*b*c^4*x^4*ArcSin[c*x] - b^2*c*x*Sqr
t[1 - c^2*x^2]*ArcSin[c*x] + 6*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] -
b^2*ArcSin[c*x]^2 + 6*b^2*c^2*x^2*ArcSin[c*x]^2 + 3*b^2*c^4*x^4*ArcSin[c*x]
^2 + 11*a*b*c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 11*b^2*c^3*x^3*ArcSin[c*x]
*Log[1 - E^(I*ArcSin[c*x])] + 11*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSi
n[c*x])] - (11*I)*b^2*c^3*x^3*PolyLog[2, -E^(I*ArcSin[c*x])] + (11*I)*b^2*c
^3*x^3*PolyLog[2, E^(I*ArcSin[c*x])]))/(3*x^3)
```

Maple [A] time = 0.421, size = 425, normalized size = 1.6

$$c^4d^2a^2x+2\,\frac{c^2d^2a^2}{x}-\frac{d^2a^2}{3\,x^3}+2\,c^3d^2b^2\arcsin(cx)\sqrt{-c^2x^2+1}+c^4d^2b^2\left(\arcsin(cx)\right)^2x-2\,b^2c^4d^2x+2\,\frac{c^2d^2b^2\left(\arcsin\cdots\right.}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x)
```

```
[Out] c^4*d^2*a^2*x+2*c^2*d^2*a^2/x-1/3*d^2*a^2/x^3+2*c^3*d^2*b^2*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)+c^4*d^2*b^2*arcsin(c*x)^2*x-2*b^2*c^4*d^2*x+2*c^2*d^2*b^2/x
*arcsin(c*x)^2-1/3*c*d^2*b^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/3*d^2*b^2
/x^3*arcsin(c*x)^2-1/3*b^2*c^2*d^2/x+11/3*c^3*d^2*b^2*arcsin(c*x)*ln(1+I*c*
x+(-c^2*x^2+1)^(1/2))-11/3*I*b^2*c^3*d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2
))-11/3*c^3*d^2*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+11/3*I*b^2*c
```

```
^3*d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*c^4*d^2*a*b*x*arcsin(c*x)+4*c^
2*d^2*a*b/x*arcsin(c*x)-2/3*d^2*a*b*arcsin(c*x)/x^3+2*c^3*d^2*a*b*(-c^2*x^2
+1)^(1/2)+11/3*c^3*d^2*a*b*arctanh(1/(-c^2*x^2+1)^(1/2))-1/3*c*d^2*a*b/x^2*
(-c^2*x^2+1)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$b^2c^4d^2x\arcsin(cx)^2 - 2\,b^2c^4d^2\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right) + a^2c^4d^2x + 2\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)abc^3d^2 + 4\left(c\,\mathrm{lo}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] b^2*c^4*d^2*x*arcsin(c*x)^2 - 2*b^2*c^4*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(
c*x)/c) + a^2*c^4*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c^3*
d^2 + 4*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b
*c^2*d^2 - 1/3*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^
2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*a*b*d^2 + 2*a^2*c^2*d^2/x - 1/3*a^2*
d^2/x^3 + 1/3*(3*x^3*integrate(2/3*(6*b^2*c^3*d^2*x^2 - b^2*c*d^2)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 -
x^3), x) + (6*b^2*c^2*d^2*x^2 - b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))^2)/x^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin(cx)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + abd^2\right.}{x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int a^2c^4\,dx + \int \frac{a^2}{x^4}\,dx + \int -\frac{2a^2c^2}{x^2}\,dx + \int b^2c^4\operatorname{asin}^2(cx)\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{x^4}\,dx + \int 2abc^4\operatorname{asin}(cx)\,dx + \int \frac{2ab\,\mathrm{a}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] d**2*(Integral(a**2*c**4, x) + Integral(a**2/x**4, x) + Integral(-2*a**2*c*
*2/x**2, x) + Integral(b**2*c**4*asin(c*x)**2, x) + Integral(b**2*asin(c*x)
**2/x**4, x) + Integral(2*a*b*c**4*asin(c*x), x) + Integral(2*a*b*asin(c*x)
/x**4, x) + Integral(-2*b**2*c**2*asin(c*x)**2/x**2, x) + Integral(-4*a*b*c
```

```
**2*asin(c*x)/x**2, x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\text{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

3.174 $\int x^4 \left(d-c^2 d x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=476

$$\frac{1}{11} d^3 x^5 \left(1-c^2 x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2+\frac{2}{33} d^3 x^5 \left(1-c^2 x^2\right)^2 \left(a+b \sin^{-1}(cx)\right)^2+\frac{8}{231} d^3 x^5 \left(1-c^2 x^2\right) \left(a+b \sin^{-1}(cx)\right)^2+\frac{3}{\cdots}$$

```
[Out] (-100976*b^2*d^3*x)/(4002075*c^4) - (50488*b^2*d^3*x^3)/(12006225*c^2) - (1
2622*b^2*d^3*x^5)/6670125 + (9410*b^2*c^2*d^3*x^7)/1120581 - (182*b^2*c^4*d
^3*x^9)/29403 + (2*b^2*c^6*d^3*x^11)/1331 + (256*b*d^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(17325*c^5) + (128*b*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(17325*c^3) + (32*b*d^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(5775*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(693*c^5)
 - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(1155*c^5) + (2*b*d^3*
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(1617*c^5) - (8*b*d^3*(1 - c^2*x^2
)^(9/2)*(a + b*ArcSin[c*x]))/(297*c^5) + (2*b*d^3*(1 - c^2*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(121*c^5) + (16*d^3*x^5*(a + b*ArcSin[c*x])^2)/1155 + (8*d
^3*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/231 + (2*d^3*x^5*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x])^2)/33 + (d^3*x^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^
2)/11
```

Rubi [A] time = 1.01765, antiderivative size = 476, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4699, 4627, 4707, 4677, 8, 30, 266, 43, 4689, 12, 1153}

$$\frac{1}{11} d^3 x^5 \left(1-c^2 x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2+\frac{2}{33} d^3 x^5 \left(1-c^2 x^2\right)^2 \left(a+b \sin^{-1}(cx)\right)^2+\frac{8}{231} d^3 x^5 \left(1-c^2 x^2\right) \left(a+b \sin^{-1}(cx)\right)^2+\frac{3}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-100976*b^2*d^3*x)/(4002075*c^4) - (50488*b^2*d^3*x^3)/(12006225*c^2) - (1
2622*b^2*d^3*x^5)/6670125 + (9410*b^2*c^2*d^3*x^7)/1120581 - (182*b^2*c^4*d
^3*x^9)/29403 + (2*b^2*c^6*d^3*x^11)/1331 + (256*b*d^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(17325*c^5) + (128*b*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(17325*c^3) + (32*b*d^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(5775*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(693*c^5)
 - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(1155*c^5) + (2*b*d^3*
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(1617*c^5) - (8*b*d^3*(1 - c^2*x^2
)^(9/2)*(a + b*ArcSin[c*x]))/(297*c^5) + (2*b*d^3*(1 - c^2*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(121*c^5) + (16*d^3*x^5*(a + b*ArcSin[c*x])^2)/1155 + (8*d
^3*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/231 + (2*d^3*x^5*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x])^2)/33 + (d^3*x^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^
2)/11
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
```

```
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{11}d^3x^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{11}(6d)\int x^4\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(\right.$$

$$=\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{77c^5}-\frac{4bd^3\left(1-c^2x^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{99c^5}+\frac{2b}{}$$

$$=\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{165c^5}-\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{231c^5}-\frac{8b}{}$$

$$=\frac{16bd^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{693c^5}-\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{1155c^5}+\frac{2}{}$$

$$=-\frac{16b^2d^3x}{7623c^4}-\frac{8b^2d^3x^3}{22869c^2}-\frac{2b^2d^3x^5}{12705}+\frac{226b^2c^2d^3x^7}{53361}-\frac{46b^2c^4d^3x^9}{9801}+\frac{2b^2c^6d^3x^{11}}{1331}+$$

$$=-\frac{8368b^2d^3x}{800415c^4}-\frac{4184b^2d^3x^3}{2401245c^2}-\frac{12622b^2d^3x^5}{6670125}+\frac{9410b^2c^2d^3x^7}{1120581}-\frac{182b^2c^4d^3x^9}{29403}+$$

$$=-\frac{8368b^2d^3x}{800415c^4}-\frac{50488b^2d^3x^3}{12006225c^2}-\frac{12622b^2d^3x^5}{6670125}+\frac{9410b^2c^2d^3x^7}{1120581}-\frac{182b^2c^4d^3x^9}{29403}-$$

$$=-\frac{100976b^2d^3x}{4002075c^4}-\frac{50488b^2d^3x^3}{12006225c^2}-\frac{12622b^2d^3x^5}{6670125}+\frac{9410b^2c^2d^3x^7}{1120581}-\frac{182b^2c^4d^3x^9}{29403}$$

Mathematica [A] time = 0.434573, size = 301, normalized size = 0.63

$$-\frac{d^3\left(12006225a^2c^5x^5\left(105c^6x^6-385c^4x^4+495c^2x^2-231\right)+6930ab\sqrt{1-c^2x^2}\left(33075c^{10}x^{10}-111475c^8x^8+117625c^6x\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d^3*(12006225*a^2*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4 + 105*c^6*x^6
) + 6930*a*b*Sqrt[1 - c^2*x^2]*(-50488 - 25244*c^2*x^2 - 18933*c^4*x^4 + 11
7625*c^6*x^6 - 111475*c^8*x^8 + 33075*c^10*x^10) + b^2*(349881840*c*x + 583
13640*c^3*x^3 + 26241138*c^5*x^5 - 116448750*c^7*x^7 + 85835750*c^9*x^9 - 2
0837250*c^11*x^11) + 6930*b*(3465*a*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x
^4 + 105*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-50488 - 25244*c^2*x^2 - 18933*c^4
*x^4 + 117625*c^6*x^6 - 111475*c^8*x^8 + 33075*c^10*x^10))*ArcSin[c*x] + 12
006225*b^2*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4 + 105*c^6*x^6)*ArcSin[
c*x]^2))/(13867189875*c^5)
```

Maple [A] time = 0.116, size = 672, normalized size = 1.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^5*(-d^3*a^2*(1/11*c^11*x^11-1/3*c^9*x^9+3/7*c^7*x^7-1/5*c^5*x^5)-d^3*b^
2*(-32/1155*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/315*arcsin(c*x)^2*(35*c^8*x^8-
180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x-2/56595*(5*c^6*x^6-21*c^4*x^4+
35*c^2*x^2-35)*c*x+16/3465*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+8/297
*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)^(1/2)+32/1155*c*x-8/93555*(35*c^8*x
^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x-16/10395*(c^2*x^2-3)*c*x+2/
121*arcsin(c*x)*(c^2*x^2-1)^5*(-c^2*x^2+1)^(1/2)-4/1925*arcsin(c*x)*(c^2*x^
2-1)^2*(-c^2*x^2+1)^(1/2)+2/1617*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/
2)+4/28875*(3*c^4*x^4-10*c^2*x^2+15)*c*x-2/83853*(63*c^10*x^10-385*c^8*x^8+
990*c^6*x^6-1386*c^4*x^4+1155*c^2*x^2-693)*c*x+1/35*arcsin(c*x)^2*(5*c^6*x^
6-21*c^4*x^4+35*c^2*x^2-35)*c*x+1/693*arcsin(c*x)^2*(63*c^10*x^10-385*c^8*x
^8+990*c^6*x^6-1386*c^4*x^4+1155*c^2*x^2-693)*c*x)-2*d^3*a*b*(1/11*arcsin(c
*x)*c^11*x^11-1/3*arcsin(c*x)*c^9*x^9+3/7*arcsin(c*x)*c^7*x^7-1/5*arcsin(c*
x)*c^5*x^5+1/121*c^10*x^10*(-c^2*x^2+1)^(1/2)-91/3267*c^8*x^8*(-c^2*x^2+1)^
(1/2)+4705/160083*c^6*x^6*(-c^2*x^2+1)^(1/2)-6311/1334025*c^4*x^4*(-c^2*x^2
+1)^(1/2)-25244/4002075*c^2*x^2*(-c^2*x^2+1)^(1/2)-50488/4002075*(-c^2*x^2+
1)^(1/2)))
```

Maxima [B] time = 1.94875, size = 1540, normalized size = 3.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/11*b^2*c^6*d^3*x^11*arcsin(c*x)^2 - 1/11*a^2*c^6*d^3*x^11 + 1/3*b^2*c^4*
d^3*x^9*arcsin(c*x)^2 + 1/3*a^2*c^4*d^3*x^9 - 3/7*b^2*c^2*d^3*x^7*arcsin(c*
x)^2 - 3/7*a^2*c^2*d^3*x^7 - 2/7623*(693*x^11*arcsin(c*x) + (63*sqrt(-c^2*x
^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*x^
6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^10 + 2
56*sqrt(-c^2*x^2 + 1)/c^12)*c)*a*b*c^6*d^3 - 2/26413695*(3465*(63*sqrt(-c^2
*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*
x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^10 +
 256*sqrt(-c^2*x^2 + 1)/c^12)*c*arcsin(c*x) - (19845*c^10*x^11 + 26950*c^8*
x^9 + 39600*c^6*x^7 + 66528*c^4*x^5 + 147840*c^2*x^3 + 887040*x)/c^10)*b^2*
c^6*d^3 + 1/5*b^2*d^3*x^5*arcsin(c*x)^2 + 2/945*(315*x^9*arcsin(c*x) + (35*
sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x
^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^
10)*c)*a*b*c^4*d^3 + 2/297675*(315*(35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt
(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 +
 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c*arcsin(c*x) - (1225*c^8*x^9 +
1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2*x^3 + 40320*x)/c^8)*b^2*c^4*d^3 + 1/
5*a^2*d^3*x^5 - 6/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 +
 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2
*x^2 + 1)/c^8)*c)*a*b*c^2*d^3 - 2/8575*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 +
 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2
*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 16
```

```
80*x)/c^6)*b^2*c^2*d^3 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x
^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d^
3 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4
 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*
x)/c^4)*b^2*d^3
```

Fricas [A] time = 1.98682, size = 1071, normalized size = 2.25

$$-\frac{10418625\left(121\,a^2-2\,b^2\right)c^{11}d^3x^{11}-471625\left(9801\,a^2-182\,b^2\right)c^9d^3x^9+12375\left(480249\,a^2-9410\,b^2\right)c^7d^3x^7-2079\left(133\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/13867189875*(10418625*(121*a^2 - 2*b^2)*c^11*d^3*x^11 - 471625*(9801*a^2
 - 182*b^2)*c^9*d^3*x^9 + 12375*(480249*a^2 - 9410*b^2)*c^7*d^3*x^7 - 2079*
(1334025*a^2 - 12622*b^2)*c^5*d^3*x^5 + 58313640*b^2*c^3*d^3*x^3 + 34988184
0*b^2*c*d^3*x + 12006225*(105*b^2*c^11*d^3*x^11 - 385*b^2*c^9*d^3*x^9 + 495
*b^2*c^7*d^3*x^7 - 231*b^2*c^5*d^3*x^5)*arcsin(c*x)^2 + 24012450*(105*a*b*c
^11*d^3*x^11 - 385*a*b*c^9*d^3*x^9 + 495*a*b*c^7*d^3*x^7 - 231*a*b*c^5*d^3*
x^5)*arcsin(c*x) + 6930*(33075*a*b*c^10*d^3*x^10 - 111475*a*b*c^8*d^3*x^8 +
 117625*a*b*c^6*d^3*x^6 - 18933*a*b*c^4*d^3*x^4 - 25244*a*b*c^2*d^3*x^2 - 5
0488*a*b*d^3 + (33075*b^2*c^10*d^3*x^10 - 111475*b^2*c^8*d^3*x^8 + 117625*b
^2*c^6*d^3*x^6 - 18933*b^2*c^4*d^3*x^4 - 25244*b^2*c^2*d^3*x^2 - 50488*b^2*
d^3)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 123.868, size = 702, normalized size = 1.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**11/11 + a**2*c**4*d**3*x**9/3 - 3*a**2*c**2*d
**3*x**7/7 + a**2*d**3*x**5/5 - 2*a*b*c**6*d**3*x**11*asin(c*x)/11 - 2*a*b*
c**5*d**3*x**10*sqrt(-c**2*x**2 + 1)/121 + 2*a*b*c**4*d**3*x**9*asin(c*x)/3
 + 182*a*b*c**3*d**3*x**8*sqrt(-c**2*x**2 + 1)/3267 - 6*a*b*c**2*d**3*x**7*
asin(c*x)/7 - 9410*a*b*c*d**3*x**6*sqrt(-c**2*x**2 + 1)/160083 + 2*a*b*d**3
*x**5*asin(c*x)/5 + 12622*a*b*d**3*x**4*sqrt(-c**2*x**2 + 1)/(1334025*c) +
50488*a*b*d**3*x**2*sqrt(-c**2*x**2 + 1)/(4002075*c**3) + 100976*a*b*d**3*s
qrt(-c**2*x**2 + 1)/(4002075*c**5) - b**2*c**6*d**3*x**11*asin(c*x)**2/11 +
 2*b**2*c**6*d**3*x**11/1331 - 2*b**2*c**5*d**3*x**10*sqrt(-c**2*x**2 + 1)*
asin(c*x)/121 + b**2*c**4*d**3*x**9*asin(c*x)**2/3 - 182*b**2*c**4*d**3*x**
9/29403 + 182*b**2*c**3*d**3*x**8*sqrt(-c**2*x**2 + 1)*asin(c*x)/3267 - 3*b
**2*c**2*d**3*x**7*asin(c*x)**2/7 + 9410*b**2*c**2*d**3*x**7/1120581 - 9410
*b**2*c*d**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/160083 + b**2*d**3*x**5*as
in(c*x)**2/5 - 12622*b**2*d**3*x**5/6670125 + 12622*b**2*d**3*x**4*sqrt(-c*
*2*x**2 + 1)*asin(c*x)/(1334025*c) - 50488*b**2*d**3*x**3/(12006225*c**2) +
 50488*b**2*d**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(4002075*c**3) - 10097
6*b**2*d**3*x/(4002075*c**4) + 100976*b**2*d**3*sqrt(-c**2*x**2 + 1)*asin(c
*x)/(4002075*c**5), Ne(c, 0)), (a**2*d**3*x**5/5, True))
```

Giac [B] time = 1.44143, size = 1168, normalized size = 2.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/11*a^2*c^6*d^3*x^11 + 1/3*a^2*c^4*d^3*x^9 - 3/7*a^2*c^2*d^3*x^7 + 1/5*a^
2*d^3*x^5 - 1/11*(c^2*x^2 - 1)^5*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2/11*(c^2*x^
2 - 1)^5*a*b*d^3*x*arcsin(c*x)/c^4 - 4/33*(c^2*x^2 - 1)^4*b^2*d^3*x*arcsin(
c*x)^2/c^4 + 2/1331*(c^2*x^2 - 1)^5*b^2*d^3*x/c^4 - 8/33*(c^2*x^2 - 1)^4*a*
b*d^3*x*arcsin(c*x)/c^4 - 1/231*(c^2*x^2 - 1)^3*b^2*d^3*x*arcsin(c*x)^2/c^4
 - 2/121*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 + 428/3
23433*(c^2*x^2 - 1)^4*b^2*d^3*x/c^4 - 2/231*(c^2*x^2 - 1)^3*a*b*d^3*x*arcsi
n(c*x)/c^4 + 2/385*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2/121*(c^2
*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 - 8/297*(c^2*x^2 - 1)^4*sqrt(-c^
2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 - 148174/110937519*(c^2*x^2 - 1)^3*b^2*d
^3*x/c^4 + 4/385*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x)/c^4 - 8/1155*(c^2*x^
2 - 1)*b^2*d^3*x*arcsin(c*x)^2/c^4 - 8/297*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 +
1)*a*b*d^3/c^5 - 2/1617*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c
*x)/c^5 + 5487704/4622396625*(c^2*x^2 - 1)^2*b^2*d^3*x/c^4 - 16/1155*(c^2*x
^2 - 1)*a*b*d^3*x*arcsin(c*x)/c^4 + 16/1155*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2
/1617*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 + 4/1925*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 - 606416/13867189875*(c^2*x^2
 - 1)*b^2*d^3*x/c^4 + 32/1155*a*b*d^3*x*arcsin(c*x)/c^4 + 4/1925*(c^2*x^2 -
 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 + 16/3465*(-c^2*x^2 + 1)^(3/2)*b^2*d^3
*arcsin(c*x)/c^5 - 382986368/13867189875*b^2*d^3*x/c^4 + 16/3465*(-c^2*x^2
+ 1)^(3/2)*a*b*d^3/c^5 + 32/1155*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5
 + 32/1155*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5
```

3.175 $\int x^3 \left(d-c^2 d x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=384

$$-\frac{1}{50} b c d^3 x^5 \left(1-c^2x^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)-\frac{1}{32} b c d^3 x^5 \left(1-c^2x^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)-\frac{31}{960} b c d^3 x^5 \sqrt{1-c^2x^2} \left(a+b\sin^{-1}(c\right.$$

```
[Out] (-79*b^2*d^3*x^2)/(5120*c^2) - (79*b^2*d^3*x^4)/15360 + (401*b^2*c^2*d^3*x^
6)/28800 - (57*b^2*c^4*d^3*x^8)/6400 + (b^2*c^6*d^3*x^10)/500 + (79*b*d^3*x
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2560*c^3) + (79*b*d^3*x^3*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(3840*c) - (31*b*c*d^3*x^5*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/960 - (b*c*d^3*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[
c*x]))/32 - (b*c*d^3*x^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/50 - (79*
d^3*(a + b*ArcSin[c*x])^2)/(5120*c^4) + (d^3*x^4*(a + b*ArcSin[c*x])^2)/40
+ (d^3*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/20 + (3*d^3*x^4*(1 - c^2*x^
2)^2*(a + b*ArcSin[c*x])^2)/40 + (d^3*x^4*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x
])^2)/10
```

Rubi [A] time = 1.59388, antiderivative size = 384, normalized size of antiderivative = 1., number of steps used = 40, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4699, 4627, 4707, 4641, 30, 4697, 14, 266, 43}

$$-\frac{1}{50} b c d^3 x^5 \left(1-c^2x^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)-\frac{1}{32} b c d^3 x^5 \left(1-c^2x^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)-\frac{31}{960} b c d^3 x^5 \sqrt{1-c^2x^2} \left(a+b\sin^{-1}(c\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-79*b^2*d^3*x^2)/(5120*c^2) - (79*b^2*d^3*x^4)/15360 + (401*b^2*c^2*d^3*x^
6)/28800 - (57*b^2*c^4*d^3*x^8)/6400 + (b^2*c^6*d^3*x^10)/500 + (79*b*d^3*x
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2560*c^3) + (79*b*d^3*x^3*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(3840*c) - (31*b*c*d^3*x^5*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/960 - (b*c*d^3*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[
c*x]))/32 - (b*c*d^3*x^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/50 - (79*
d^3*(a + b*ArcSin[c*x])^2)/(5120*c^4) + (d^3*x^4*(a + b*ArcSin[c*x])^2)/40
+ (d^3*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/20 + (3*d^3*x^4*(1 - c^2*x^
2)^2*(a + b*ArcSin[c*x])^2)/40 + (d^3*x^4*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x
])^2)/10
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
```

```
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{5}(3d)\int x^3\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(c\right.$$

$$= -\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.$$

$$= -\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}\right.$$

$$= -\frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(\right.$$

$$= \frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd^3x^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(\right.}{3840c}$$

$$= -\frac{79b^2d^3x^4}{15360}+\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd^3x\sqrt{1-c^2x^2}}{256}$$

$$= -\frac{79b^2d^3x^2}{5120c^2}-\frac{79b^2d^3x^4}{15360}+\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd}{}$$

Mathematica [A] time = 0.437581, size = 287, normalized size = 0.75

$$-\frac{d^3\left(cx\left(28800a^2c^3x^3\left(4c^6x^6-15c^4x^4+20c^2x^2-10\right)+30ab\sqrt{1-c^2x^2}\left(768c^8x^8-2736c^6x^6+3208c^4x^4-790c^2x^2-118\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d^3*(c*x*(28800*a^2*c^3*x^3*(-10 + 20*c^2*x^2 - 15*c^4*x^4 + 4*c^6*x^6) +
 30*a*b*Sqrt[1 - c^2*x^2]*(-1185 - 790*c^2*x^2 + 3208*c^4*x^4 - 2736*c^6*x^
6 + 768*c^8*x^8) + b^2*(17775*c*x + 5925*c^3*x^3 - 16040*c^5*x^5 + 10260*c^
7*x^7 - 2304*c^9*x^9)) + 30*b*(b*c*x*Sqrt[1 - c^2*x^2]*(-1185 - 790*c^2*x^2
 + 3208*c^4*x^4 - 2736*c^6*x^6 + 768*c^8*x^8) + 15*a*(79 - 1280*c^4*x^4 + 2
560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x^10))*ArcSin[c*x] + 225*b^2*(79 - 12
80*c^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x^10)*ArcSin[c*x]^2))/(
1152000*c^4)
```

Maple [A] time = 0.105, size = 519, normalized size = 1.4

$$\frac{1}{c^4}\left(-d^3a^2\left(\frac{c^{10}x^{10}}{10}-\frac{3\,c^8x^8}{8}+\frac{c^6x^6}{2}-\frac{c^4x^4}{4}\right)-d^3b^2\left(\frac{(\arcsin(cx))^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)}{1536}\left(-48\,c^7x^7\sqrt{-c^2x^2+1}+200\,c\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^4*(-d^3*a^2*(1/10*c^10*x^10-3/8*c^8*x^8+1/2*c^6*x^6-1/4*c^4*x^4)-d^3*b^
2*(1/8*arcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x^
2+1)^(1/2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+27
9*c*x*(-c^2*x^2+1)^(1/2)+105*arcsin(c*x))+49/5120*arcsin(c*x)^2-7/6400*(c^2
*x^2-1)^4+49/28800*(c^2*x^2-1)^3-49/15360*(c^2*x^2-1)^2+49/5120*c^2*x^2-49/
5120+1/10*arcsin(c*x)^2*(c^2*x^2-1)^5+1/6400*arcsin(c*x)*(128*c^9*x^9*(-c^2
*x^2+1)^(1/2)-656*c^7*x^7*(-c^2*x^2+1)^(1/2)+1368*c^5*x^5*(-c^2*x^2+1)^(1/2
)-1490*c^3*x^3*(-c^2*x^2+1)^(1/2)+965*c*x*(-c^2*x^2+1)^(1/2)+315*arcsin(c*x
```

```
))-1/500*(c^2*x^2-1)^5)-2*d^3*a*b*(1/10*arcsin(c*x)*c^10*x^10-3/8*arcsin(c*
x)*c^8*x^8+1/2*arcsin(c*x)*c^6*x^6-1/4*c^4*x^4*arcsin(c*x)+1/100*c^9*x^9*(-
c^2*x^2+1)^(1/2)-57/1600*c^7*x^7*(-c^2*x^2+1)^(1/2)+401/9600*c^5*x^5*(-c^2*
x^2+1)^(1/2)-79/7680*c^3*x^3*(-c^2*x^2+1)^(1/2)-79/5120*c*x*(-c^2*x^2+1)^(1
/2)+79/5120*arcsin(c*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/10*a^2*c^6*d^3*x^10 + 3/8*a^2*c^4*d^3*x^8 - 1/2*a^2*c^2*d^3*x^6 - 1/6400
*(1280*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 + 144*sqrt(-c^2*x
^2 + 1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(-c^2*x^2 + 1)*x
^3/c^8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c^2*x/sqrt(c^2))/(sqrt(
c^2)*c^10))*c)*a*b*c^6*d^3 + 1/512*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2
 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c
^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*
c^8))*c)*a*b*c^4*d^3 + 1/4*a^2*d^3*x^4 - 1/48*(48*x^6*arcsin(c*x) + (8*sqrt
(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 +
 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*a*b*c^2*d^3 + 1/
16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1
)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*a*b*d^3 - 1/40*(4*b
^2*c^6*d^3*x^10 - 15*b^2*c^4*d^3*x^8 + 20*b^2*c^2*d^3*x^6 - 10*b^2*d^3*x^4)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - integrate(1/20*(4*b^2*c^7*d
^3*x^10 - 15*b^2*c^5*d^3*x^8 + 20*b^2*c^3*d^3*x^6 - 10*b^2*c*d^3*x^4)*sqrt(
c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2
 - 1), x)
```

Fricas [A] time = 2.02756, size = 938, normalized size = 2.44

$$-\frac{2304\left(50\,a^2-b^2\right)c^{10}d^3x^{10}-540\left(800\,a^2-19\,b^2\right)c^8d^3x^8+40\left(14400\,a^2-401\,b^2\right)c^6d^3x^6-75\left(3840\,a^2-79\,b^2\right)c^4d^3x^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/1152000*(2304*(50*a^2 - b^2)*c^10*d^3*x^10 - 540*(800*a^2 - 19*b^2)*c^8*
d^3*x^8 + 40*(14400*a^2 - 401*b^2)*c^6*d^3*x^6 - 75*(3840*a^2 - 79*b^2)*c^4
*d^3*x^4 + 17775*b^2*c^2*d^3*x^2 + 225*(512*b^2*c^10*d^3*x^10 - 1920*b^2*c^
8*d^3*x^8 + 2560*b^2*c^6*d^3*x^6 - 1280*b^2*c^4*d^3*x^4 + 79*b^2*d^3)*arcsi
n(c*x)^2 + 450*(512*a*b*c^10*d^3*x^10 - 1920*a*b*c^8*d^3*x^8 + 2560*a*b*c^6
*d^3*x^6 - 1280*a*b*c^4*d^3*x^4 + 79*a*b*d^3)*arcsin(c*x) + 30*(768*a*b*c^9
*d^3*x^9 - 2736*a*b*c^7*d^3*x^7 + 3208*a*b*c^5*d^3*x^5 - 790*a*b*c^3*d^3*x^
3 - 1185*a*b*c*d^3*x + (768*b^2*c^9*d^3*x^9 - 2736*b^2*c^7*d^3*x^7 + 3208*b
^2*c^5*d^3*x^5 - 790*b^2*c^3*d^3*x^3 - 1185*b^2*c*d^3*x)*arcsin(c*x))*sqrt(
-c^2*x^2 + 1))/c^4
```

Sympy [A] time = 95.649, size = 654, normalized size = 1.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**10/10 + 3*a**2*c**4*d**3*x**8/8 - a**2*c**2*d
**3*x**6/2 + a**2*d**3*x**4/4 - a*b*c**6*d**3*x**10*asin(c*x)/5 - a*b*c**5*
d**3*x**9*sqrt(-c**2*x**2 + 1)/50 + 3*a*b*c**4*d**3*x**8*asin(c*x)/4 + 57*a
*b*c**3*d**3*x**7*sqrt(-c**2*x**2 + 1)/800 - a*b*c**2*d**3*x**6*asin(c*x) -
 401*a*b*c*d**3*x**5*sqrt(-c**2*x**2 + 1)/4800 + a*b*d**3*x**4*asin(c*x)/2
+ 79*a*b*d**3*x**3*sqrt(-c**2*x**2 + 1)/(3840*c) + 79*a*b*d**3*x*sqrt(-c**2
*x**2 + 1)/(2560*c**3) - 79*a*b*d**3*asin(c*x)/(2560*c**4) - b**2*c**6*d**3
*x**10*asin(c*x)**2/10 + b**2*c**6*d**3*x**10/500 - b**2*c**5*d**3*x**9*sqr
t(-c**2*x**2 + 1)*asin(c*x)/50 + 3*b**2*c**4*d**3*x**8*asin(c*x)**2/8 - 57*
b**2*c**4*d**3*x**8/6400 + 57*b**2*c**3*d**3*x**7*sqrt(-c**2*x**2 + 1)*asin
(c*x)/800 - b**2*c**2*d**3*x**6*asin(c*x)**2/2 + 401*b**2*c**2*d**3*x**6/28
800 - 401*b**2*c*d**3*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/4800 + b**2*d**3*
x**4*asin(c*x)**2/4 - 79*b**2*d**3*x**4/15360 + 79*b**2*d**3*x**3*sqrt(-c**
2*x**2 + 1)*asin(c*x)/(3840*c) - 79*b**2*d**3*x**2/(5120*c**2) + 79*b**2*d*
*3*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2560*c**3) - 79*b**2*d**3*asin(c*x)**2
/(5120*c**4), Ne(c, 0)), (a**2*d**3*x**4/4, True))
```

Giac [A] time = 1.39333, size = 840, normalized size = 2.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/50*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c^3 - 1/10*(
c^2*x^2 - 1)^5*b^2*d^3*arcsin(c*x)^2/c^4 - 1/50*(c^2*x^2 - 1)^4*sqrt(-c^2*x
^2 + 1)*a*b*d^3*x/c^3 - 7/800*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*
arcsin(c*x)/c^3 - 1/5*(c^2*x^2 - 1)^5*a*b*d^3*arcsin(c*x)/c^4 - 1/8*(c^2*x^
2 - 1)^4*b^2*d^3*arcsin(c*x)^2/c^4 - 7/800*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 +
1)*a*b*d^3*x/c^3 + 49/4800*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arc
sin(c*x)/c^3 - 1/10*(c^2*x^2 - 1)^5*a^2*d^3/c^4 + 1/500*(c^2*x^2 - 1)^5*b^2
*d^3/c^4 - 1/4*(c^2*x^2 - 1)^4*a*b*d^3*arcsin(c*x)/c^4 + 49/4800*(c^2*x^2 -
 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c^3 + 49/3840*(-c^2*x^2 + 1)^(3/2)*b^2*d
^3*x*arcsin(c*x)/c^3 - 1/8*(c^2*x^2 - 1)^4*a^2*d^3/c^4 + 7/6400*(c^2*x^2 -
1)^4*b^2*d^3/c^4 + 49/3840*(-c^2*x^2 + 1)^(3/2)*a*b*d^3*x/c^3 + 49/2560*sqr
t(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c^3 - 49/28800*(c^2*x^2 - 1)^3*b^2*d^
3/c^4 + 49/2560*sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c^3 + 49/15360*(c^2*x^2 - 1)^2
*b^2*d^3/c^4 + 49/5120*b^2*d^3*arcsin(c*x)^2/c^4 - 49/5120*(c^2*x^2 - 1)*b^
2*d^3/c^4 + 49/2560*a*b*d^3*arcsin(c*x)/c^4 - 232981/36864000*b^2*d^3/c^4
```

3.176 $\int x^2 \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=391

$$\frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{2}{21}d^3x^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{8}{105}d^3x^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+$$

```
[Out] (-10516*b^2*d^3*x)/(99225*c^2) - (5258*b^2*d^3*x^3)/297675 + (4198*b^2*c^2*
d^3*x^5)/165375 - (374*b^2*c^4*d^3*x^7)/27783 + (2*b^2*c^6*d^3*x^9)/729 + (
64*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c^3) + (32*b*d^3*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c) + (16*b*d^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x]))/(315*c^3) + (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x]))/(525*c^3) + (2*b*d^3*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(4
41*c^3) - (2*b*d^3*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^3) + (16*
d^3*x^3*(a + b*ArcSin[c*x])^2)/315 + (8*d^3*x^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/105 + (2*d^3*x^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/21 + (d^3
*x^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/9
```

Rubi [A] time = 0.822623, antiderivative size = 391, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4699, 4627, 4707, 4677, 8, 30, 266, 43, 4689, 12, 373}

$$\frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{2}{21}d^3x^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{8}{105}d^3x^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-10516*b^2*d^3*x)/(99225*c^2) - (5258*b^2*d^3*x^3)/297675 + (4198*b^2*c^2*
d^3*x^5)/165375 - (374*b^2*c^4*d^3*x^7)/27783 + (2*b^2*c^6*d^3*x^9)/729 + (
64*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c^3) + (32*b*d^3*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c) + (16*b*d^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x]))/(315*c^3) + (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x]))/(525*c^3) + (2*b*d^3*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(4
41*c^3) - (2*b*d^3*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^3) + (16*
d^3*x^3*(a + b*ArcSin[c*x])^2)/315 + (8*d^3*x^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/105 + (2*d^3*x^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/21 + (d^3
*x^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/9
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
```

```
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 373

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rubi steps

$$\int x^2 \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}(2d)\int x^2\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}\right.$$

$$=\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{63c^3}-\frac{2bd^3\left(1-c^2x^2\right)^{9/2}\left(a+b\sin^{-1}(cx)\right)}{81c^3}+$$

$$=\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{105c^3}+\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{441c^3}-$$

$$=\frac{16bd^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{315c^3}+\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{525c^3}$$

$$=-\frac{4b^2d^3x}{567c^2}-\frac{2b^2d^3x^3}{1701}+\frac{2}{189}b^2c^2d^3x^5-\frac{38b^2c^4d^3x^7}{3969}+\frac{2}{729}b^2c^6d^3x^9+\frac{32bd^3}{}$$

$$=-\frac{3796b^2d^3x}{99225c^2}-\frac{5258b^2d^3x^3}{297675}+\frac{4198b^2c^2d^3x^5}{165375}-\frac{374b^2c^4d^3x^7}{27783}+\frac{2}{729}b^2c^6d^3x^9$$

$$=-\frac{10516b^2d^3x}{99225c^2}-\frac{5258b^2d^3x^3}{297675}+\frac{4198b^2c^2d^3x^5}{165375}-\frac{374b^2c^4d^3x^7}{27783}+\frac{2}{729}b^2c^6d^3x$$

Mathematica [A] time = 0.38232, size = 277, normalized size = 0.71

$$-\frac{d^3\left(99225a^2c^3x^3\left(35c^6x^6-135c^4x^4+189c^2x^2-105\right)+630ab\sqrt{1-c^2x^2}\left(1225c^8x^8-4675c^6x^6+6297c^4x^4-2629c^2\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d^3*(99225*a^2*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6) +
630*a*b*Sqrt[1 - c^2*x^2]*(-5258 - 2629*c^2*x^2 + 6297*c^4*x^4 - 4675*c^6*x
^6 + 1225*c^8*x^8) + b^2*(3312540*c*x + 552090*c^3*x^3 - 793422*c^5*x^5 + 4
20750*c^7*x^7 - 85750*c^9*x^9) + 630*b*(315*a*c^3*x^3*(-105 + 189*c^2*x^2 -
 135*c^4*x^4 + 35*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-5258 - 2629*c^2*x^2 + 62
97*c^4*x^4 - 4675*c^6*x^6 + 1225*c^8*x^8))*ArcSin[c*x] + 99225*b^2*c^3*x^3*
(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6)*ArcSin[c*x]^2))/(31255875*c
^3)
```

Maple [A] time = 0.054, size = 525, normalized size = 1.3

$$\frac{1}{c^3}\left(-d^3a^2\left(\frac{c^9x^9}{9}-\frac{3c^7x^7}{7}+\frac{3c^5x^5}{5}-\frac{c^3x^3}{3}\right)-d^3b^2\left(\frac{(\arcsin(cx))^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{32cx}{315}-\frac{32\,a}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^3*(-d^3*a^2*(1/9*c^9*x^9-3/7*c^7*x^7+3/5*c^5*x^5-1/3*c^3*x^3)-d^3*b^2*(
1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+32/315*c*x-32/3
15*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/441*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2
+1)^(1/2)-2/15435*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x-4/525*arcsin(c*x
)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)+4/7875*(3*c^4*x^4-10*c^2*x^2+15)*c*x+16/
945*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-16/2835*(c^2*x^2-3)*c*x+1/31
5*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x+2/
81*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)^(1/2)-2/25515*(35*c^8*x^8-180*c^6
*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x)-2*d^3*a*b*(1/9*arcsin(c*x)*c^9*x^9-3
/7*arcsin(c*x)*c^7*x^7+3/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^3*arcsin(c*x)+1/81
*c^8*x^8*(-c^2*x^2+1)^(1/2)-187/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+2099/33075*
c^4*x^4*(-c^2*x^2+1)^(1/2)-2629/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)-5258/99225
*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.82218, size = 1277, normalized size = 3.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/9*b^2*c^6*d^3*x^9*arcsin(c*x)^2 - 1/9*a^2*c^6*d^3*x^9 + 3/7*b^2*c^4*d^3*
x^7*arcsin(c*x)^2 + 3/7*a^2*c^4*d^3*x^7 - 3/5*b^2*c^2*d^3*x^5*arcsin(c*x)^2
 - 2/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-
c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1
)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*a*b*c^6*d^3 - 2/893025*(315*(35
*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*
x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c
^10)*c*arcsin(c*x) - (1225*c^8*x^9 + 1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2
*x^3 + 40320*x)/c^8)*b^2*c^6*d^3 - 3/5*a^2*c^2*d^3*x^5 + 6/245*(35*x^7*arcs
in(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*
sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^4*d^3 + 2/
8575*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*
sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75
*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^4*d^3 + 1/3*b^2*d
^3*x^3*arcsin(c*x)^2 - 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4
/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*
d^3 - 2/375*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^
4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120
*x)/c^4)*b^2*c^2*d^3 + 1/3*a^2*d^3*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-
c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^3 + 2/27*(3*c*(sqrt
(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 +
 6*x)/c^2)*b^2*d^3
```

Fricas [A] time = 2.0016, size = 903, normalized size = 2.31

$$-\frac{42875\left(81\,a^2-2\,b^2\right)c^9d^3x^9-1125\left(11907\,a^2-374\,b^2\right)c^7d^3x^7+189\left(99225\,a^2-4198\,b^2\right)c^5d^3x^5-105\left(99225\,a^2-5258\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/31255875*(42875*(81*a^2 - 2*b^2)*c^9*d^3*x^9 - 1125*(11907*a^2 - 374*b^2
)*c^7*d^3*x^7 + 189*(99225*a^2 - 4198*b^2)*c^5*d^3*x^5 - 105*(99225*a^2 - 5
258*b^2)*c^3*d^3*x^3 + 3312540*b^2*c*d^3*x + 99225*(35*b^2*c^9*d^3*x^9 - 13
5*b^2*c^7*d^3*x^7 + 189*b^2*c^5*d^3*x^5 - 105*b^2*c^3*d^3*x^3)*arcsin(c*x)^
2 + 198450*(35*a*b*c^9*d^3*x^9 - 135*a*b*c^7*d^3*x^7 + 189*a*b*c^5*d^3*x^5
- 105*a*b*c^3*d^3*x^3)*arcsin(c*x) + 630*(1225*a*b*c^8*d^3*x^8 - 4675*a*b*c
^6*d^3*x^6 + 6297*a*b*c^4*d^3*x^4 - 2629*a*b*c^2*d^3*x^2 - 5258*a*b*d^3 + (
1225*b^2*c^8*d^3*x^8 - 4675*b^2*c^6*d^3*x^6 + 6297*b^2*c^4*d^3*x^4 - 2629*b
^2*c^2*d^3*x^2 - 5258*b^2*d^3)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] time = 55.6446, size = 626, normalized size = 1.6

$$\begin{cases} -\frac{a^2c^6d^3x^9}{9} + \frac{3a^2c^4d^3x^7}{7} - \frac{3a^2c^2d^3x^5}{5} + \frac{a^2d^3x^3}{3} - \frac{2abc^6d^3x^9\operatorname{asin}(cx)}{9} - \frac{2abc^5d^3x^8\sqrt{-c^2x^2+1}}{81} + \frac{6abc^4d^3x^7\operatorname{asin}(cx)}{7} + \frac{374abc^3d^3x^6\sqrt{-c^2x^2+1}}{3969} - \\ \frac{a^2d^3x^3}{3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**9/9 + 3*a**2*c**4*d**3*x**7/7 - 3*a**2*c**2*d
**3*x**5/5 + a**2*d**3*x**3/3 - 2*a*b*c**6*d**3*x**9*asin(c*x)/9 - 2*a*b*c*
*5*d**3*x**8*sqrt(-c**2*x**2 + 1)/81 + 6*a*b*c**4*d**3*x**7*asin(c*x)/7 + 3
74*a*b*c**3*d**3*x**6*sqrt(-c**2*x**2 + 1)/3969 - 6*a*b*c**2*d**3*x**5*asin
(c*x)/5 - 4198*a*b*c*d**3*x**4*sqrt(-c**2*x**2 + 1)/33075 + 2*a*b*d**3*x**3
*asin(c*x)/3 + 5258*a*b*d**3*x**2*sqrt(-c**2*x**2 + 1)/(99225*c) + 10516*a*
b*d**3*sqrt(-c**2*x**2 + 1)/(99225*c**3) - b**2*c**6*d**3*x**9*asin(c*x)**2
/9 + 2*b**2*c**6*d**3*x**9/729 - 2*b**2*c**5*d**3*x**8*sqrt(-c**2*x**2 + 1)
*asin(c*x)/81 + 3*b**2*c**4*d**3*x**7*asin(c*x)**2/7 - 374*b**2*c**4*d**3*x
**7/27783 + 374*b**2*c**3*d**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/3969 - 3
*b**2*c**2*d**3*x**5*asin(c*x)**2/5 + 4198*b**2*c**2*d**3*x**5/165375 - 419
8*b**2*c*d**3*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/33075 + b**2*d**3*x**3*as
in(c*x)**2/3 - 5258*b**2*d**3*x**3/297675 + 5258*b**2*d**3*x**2*sqrt(-c**2*
x**2 + 1)*asin(c*x)/(99225*c) - 10516*b**2*d**3*x/(99225*c**2) + 10516*b**2
*d**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(99225*c**3), Ne(c, 0)), (a**2*d**3*x*
*3/3, True))
```

Giac [B] time = 1.41748, size = 967, normalized size = 2.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/9*a^2*c^6*d^3*x^9 + 3/7*a^2*c^4*d^3*x^7 - 3/5*a^2*c^2*d^3*x^5 - 1/9*(c^2
*x^2 - 1)^4*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/9*(c^2*x^2 - 1)^4*a*b*d^3*x*arc
sin(c*x)/c^2 - 1/63*(c^2*x^2 - 1)^3*b^2*d^3*x*arcsin(c*x)^2/c^2 + 2/729*(c^
2*x^2 - 1)^4*b^2*d^3*x/c^2 + 1/3*a^2*d^3*x^3 - 2/63*(c^2*x^2 - 1)^3*a*b*d^3
*x*arcsin(c*x)/c^2 + 2/105*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/
81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 - 622/250047*
(c^2*x^2 - 1)^3*b^2*d^3*x/c^2 + 4/105*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x)
/c^2 - 8/315*(c^2*x^2 - 1)*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/81*(c^2*x^2 - 1)
^4*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 - 2/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1
)*b^2*d^3*arcsin(c*x)/c^3 + 15224/10418625*(c^2*x^2 - 1)^2*b^2*d^3*x/c^2 -
```

```
16/315*(c^2*x^2 - 1)*a*b*d^3*x*arcsin(c*x)/c^2 + 16/315*b^2*d^3*x*arcsin(c*
x)^2/c^2 - 2/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 + 4/525*(c^
2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 + 115504/31255875*(
c^2*x^2 - 1)*b^2*d^3*x/c^2 + 32/315*a*b*d^3*x*arcsin(c*x)/c^2 + 4/525*(c^2*
x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 + 16/945*(-c^2*x^2 + 1)^(3/2)*b^2
*d^3*arcsin(c*x)/c^3 - 3406208/31255875*b^2*d^3*x/c^2 + 16/945*(-c^2*x^2 +
1)^(3/2)*a*b*d^3/c^3 + 32/315*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 +
32/315*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3
```

3.177 $\int x\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=268

$$\frac{bd^3x\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{32c}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{192c}+\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{768c}+$$

```
[Out] (-175*b^2*d^3*x^2)/3072 + (35*b^2*c^2*d^3*x^4)/3072 + (7*b^2*d^3*(1 - c^2*x
^2)^3)/(1152*c^2) + (b^2*d^3*(1 - c^2*x^2)^4)/(256*c^2) + (35*b*d^3*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(512*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2)
*(a + b*ArcSin[c*x]))/(768*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSi
n[c*x]))/(192*c) + (b*d^3*x*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(32*c)
 + (35*d^3*(a + b*ArcSin[c*x])^2)/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(a + b*
ArcSin[c*x])^2)/(8*c^2)
```

Rubi [A] time = 0.246654, antiderivative size = 268, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {4677, 4649, 4647, 4641, 30, 14, 261}

$$\frac{bd^3x\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{32c}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{192c}+\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{768c}+$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-175*b^2*d^3*x^2)/3072 + (35*b^2*c^2*d^3*x^4)/3072 + (7*b^2*d^3*(1 - c^2*x
^2)^3)/(1152*c^2) + (b^2*d^3*(1 - c^2*x^2)^4)/(256*c^2) + (35*b*d^3*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(512*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2)
*(a + b*ArcSin[c*x]))/(768*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSi
n[c*x]))/(192*c) + (b*d^3*x*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(32*c)
 + (35*d^3*(a + b*ArcSin[c*x])^2)/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(a + b*
ArcSin[c*x])^2)/(8*c^2)
```


Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx=-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)^2}{8c^2}+\frac{\left(bd^3\right)\int\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)dx}{4c}$$
$$=\frac{bd^3x\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{32c}-\frac{d^3\left(1-c^2x^2\right)^4\left(a+b\sin^{-1}(cx)\right)^2}{8c^2}-\frac{1}{32}\left(b^2\right.$$
$$=\frac{b^2d^3\left(1-c^2x^2\right)^4}{256c^2}+\frac{7bd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{192c}+\frac{bd^3x\left(1-c^2x^2\right)^{7/2}\left(a\right.}{32c}$$
$$=\frac{7b^2d^3\left(1-c^2x^2\right)^3}{1152c^2}+\frac{b^2d^3\left(1-c^2x^2\right)^4}{256c^2}+\frac{35bd^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{768c}+$$
$$=\frac{7b^2d^3\left(1-c^2x^2\right)^3}{1152c^2}+\frac{b^2d^3\left(1-c^2x^2\right)^4}{256c^2}+\frac{35bd^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{512c}+\frac{35}{-}$$
$$=-\frac{175b^2d^3x^2}{3072}+\frac{35b^2c^2d^3x^4}{3072}+\frac{7b^2d^3\left(1-c^2x^2\right)^3}{1152c^2}+\frac{b^2d^3\left(1-c^2x^2\right)^4}{256c^2}+\frac{35bd^3x\sqrt{1}}{}$$

Mathematica [A] time = 0.336713, size = 257, normalized size = 0.96

$$-\frac{d^3\left(cx\left(1152a^2cx\left(c^6x^6-4c^4x^4+6c^2x^2-4\right)+6ab\sqrt{1-c^2x^2}\left(48c^6x^6-200c^4x^4+326c^2x^2-279\right)+b^2cx\left(-36c^6x^6+20\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d^3*(c*x*(b^2*c*x*(837 - 489*c^2*x^2 + 200*c^4*x^4 - 36*c^6*x^6) + 1152*a
^2*c*x*(-4 + 6*c^2*x^2 - 4*c^4*x^4 + c^6*x^6) + 6*a*b*Sqrt[1 - c^2*x^2]*(-2
79 + 326*c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6)) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2
]*(-279 + 326*c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6) + 3*a*(93 - 512*c^2*x^2 +
 768*c^4*x^4 - 512*c^6*x^6 + 128*c^8*x^8))*ArcSin[c*x] + 9*b^2*(93 - 512*c^
2*x^2 + 768*c^4*x^4 - 512*c^6*x^6 + 128*c^8*x^8)*ArcSin[c*x]^2))/(9216*c^2)
```

Maple [A] time = 0.041, size = 358, normalized size = 1.3

$$\frac{1}{c^2}\left(-d^3a^2\left(\frac{c^8x^8}{8}-\frac{c^6x^6}{2}+\frac{3\,c^4x^4}{4}-\frac{c^2x^2}{2}\right)-d^3b^2\left(\frac{(\arcsin(cx))^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)}{1536}\left(-48\,c^7x^7\sqrt{-c^2x^2+1}+200\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c^2*(-d^3*a^2*(1/8*c^8*x^8-1/2*c^6*x^6+3/4*c^4*x^4-1/2*c^2*x^2)-d^3*b^2*(
1/8*arcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x^2+1
)^(1/2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+279*c
*x*(-c^2*x^2+1)^(1/2)+105*arcsin(c*x))+35/1024*arcsin(c*x)^2-1/256*(c^2*x^2
-1)^4+7/1152*(c^2*x^2-1)^3-35/3072*(c^2*x^2-1)^2+35/1024*c^2*x^2-35/1024)-2
*d^3*a*b*(1/8*arcsin(c*x)*c^8*x^8-1/2*arcsin(c*x)*c^6*x^6+3/4*c^4*x^4*arcsi
n(c*x)-1/2*c^2*x^2*arcsin(c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(1/2)-25/384*c^5*x
^5*(-c^2*x^2+1)^(1/2)+163/1536*c^3*x^3*(-c^2*x^2+1)^(1/2)-93/1024*c*x*(-c^2
*x^2+1)^(1/2)+93/1024*arcsin(c*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{8}\,a^2c^6d^3x^8+\frac{1}{2}\,a^2c^4d^3x^6-\frac{1}{1536}\left(384\,x^8\arcsin(cx)+\left(\frac{48\,\sqrt{-c^2x^2+1}x^7}{c^2}+\frac{56\,\sqrt{-c^2x^2+1}x^5}{c^4}+\frac{70\,\sqrt{-c^2x^2+1}x^3}{c^6}+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/8*a^2*c^6*d^3*x^8 + 1/2*a^2*c^4*d^3*x^6 - 1/1536*(384*x^8*arcsin(c*x) +
(48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c
^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(
c^2))/(sqrt(c^2)*c^8))*c)*a*b*c^6*d^3 - 3/4*a^2*c^2*d^3*x^4 + 1/48*(48*x^6*
arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4
 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6)
)*c)*a*b*c^4*d^3 - 3/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2
+ 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c
)*a*b*c^2*d^3 + 1/2*a^2*d^3*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2
 + 1)*x/c^2 - arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^2)))*a*b*d^3 - 1/8*(b^2*
c^6*d^3*x^8 - 4*b^2*c^4*d^3*x^6 + 6*b^2*c^2*d^3*x^4 - 4*b^2*d^3*x^2)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - integrate(1/4*(b^2*c^7*d^3*x^8 - 4
*b^2*c^5*d^3*x^6 + 6*b^2*c^3*d^3*x^4 - 4*b^2*c*d^3*x^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Fricas [A] time = 2.02357, size = 799, normalized size = 2.98

$$-\frac{36\left(32\,a^2-b^2\right)c^8d^3x^8-8\left(576\,a^2-25\,b^2\right)c^6d^3x^6+3\left(2304\,a^2-163\,b^2\right)c^4d^3x^4-9\left(512\,a^2-93\,b^2\right)c^2d^3x^2+9\left(128\,b^2c^8d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/9216*(36*(32*a^2 - b^2)*c^8*d^3*x^8 - 8*(576*a^2 - 25*b^2)*c^6*d^3*x^6 +
 3*(2304*a^2 - 163*b^2)*c^4*d^3*x^4 - 9*(512*a^2 - 93*b^2)*c^2*d^3*x^2 + 9*
(128*b^2*c^8*d^3*x^8 - 512*b^2*c^6*d^3*x^6 + 768*b^2*c^4*d^3*x^4 - 512*b^2*
c^2*d^3*x^2 + 93*b^2*d^3)*arcsin(c*x)^2 + 18*(128*a*b*c^8*d^3*x^8 - 512*a*b
*c^6*d^3*x^6 + 768*a*b*c^4*d^3*x^4 - 512*a*b*c^2*d^3*x^2 + 93*a*b*d^3)*arcs
in(c*x) + 6*(48*a*b*c^7*d^3*x^7 - 200*a*b*c^5*d^3*x^5 + 326*a*b*c^3*d^3*x^3
 - 279*a*b*c*d^3*x + (48*b^2*c^7*d^3*x^7 - 200*b^2*c^5*d^3*x^5 + 326*b^2*c^
3*d^3*x^3 - 279*b^2*c*d^3*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] time = 38.3857, size = 573, normalized size = 2.14

$$\begin{cases} -\frac{a^2c^6d^3x^8}{8}+\frac{a^2c^4d^3x^6}{2}-\frac{3a^2c^2d^3x^4}{4}+\frac{a^2d^3x^2}{2}-\frac{abc^6d^3x^8\operatorname{asin}(cx)}{4}-\frac{abc^5d^3x^7\sqrt{-c^2x^2+1}}{32}+abc^4d^3x^6\operatorname{asin}(cx)+\frac{25abc^3d^3x^5\sqrt{-c^2x^2+1}}{192}-\frac{3abc}{} \\ \frac{a^2d^3x^2}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**8/8 + a**2*c**4*d**3*x**6/2 - 3*a**2*c**2*d**
3*x**4/4 + a**2*d**3*x**2/2 - a*b*c**6*d**3*x**8*asin(c*x)/4 - a*b*c**5*d**
3*x**7*sqrt(-c**2*x**2 + 1)/32 + a*b*c**4*d**3*x**6*asin(c*x) + 25*a*b*c**3
*d**3*x**5*sqrt(-c**2*x**2 + 1)/192 - 3*a*b*c**2*d**3*x**4*asin(c*x)/2 - 16
3*a*b*c*d**3*x**3*sqrt(-c**2*x**2 + 1)/768 + a*b*d**3*x**2*asin(c*x) + 93*a
*b*d**3*x*sqrt(-c**2*x**2 + 1)/(512*c) - 93*a*b*d**3*asin(c*x)/(512*c**2) -
 b**2*c**6*d**3*x**8*asin(c*x)**2/8 + b**2*c**6*d**3*x**8/256 - b**2*c**5*d
**3*x**7*sqrt(-c**2*x**2 + 1)*asin(c*x)/32 + b**2*c**4*d**3*x**6*asin(c*x)*
*2/2 - 25*b**2*c**4*d**3*x**6/1152 + 25*b**2*c**3*d**3*x**5*sqrt(-c**2*x**2
 + 1)*asin(c*x)/192 - 3*b**2*c**2*d**3*x**4*asin(c*x)**2/4 + 163*b**2*c**2*
d**3*x**4/3072 - 163*b**2*c*d**3*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/768 +
b**2*d**3*x**2*asin(c*x)**2/2 - 93*b**2*d**3*x**2/1024 + 93*b**2*d**3*x*sqr
t(-c**2*x**2 + 1)*asin(c*x)/(512*c) - 93*b**2*d**3*asin(c*x)**2/(1024*c**2)
, Ne(c, 0)), (a**2*d**3*x**2/2, True))
```

Giac [A] time = 1.47056, size = 610, normalized size = 2.28

$$-\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{32\,c}-\frac{\left(c^2x^2-1\right)^4b^2d^3\arcsin(cx)^2}{8\,c^2}-\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}abd^3x}{32\,c}+\frac{7\left(c^2x^2-1\right)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c - 1/8*(c^2
*x^2 - 1)^4*b^2*d^3*arcsin(c*x)^2/c^2 - 1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2
```

```
+ 1)*a*b*d^3*x/c + 7/192*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsi
n(c*x)/c - 1/4*(c^2*x^2 - 1)^4*a*b*d^3*arcsin(c*x)/c^2 + 7/192*(c^2*x^2 - 1
)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c + 35/768*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*x*
arcsin(c*x)/c - 1/8*(c^2*x^2 - 1)^4*a^2*d^3/c^2 + 1/256*(c^2*x^2 - 1)^4*b^2
*d^3/c^2 + 35/768*(-c^2*x^2 + 1)^(3/2)*a*b*d^3*x/c + 35/512*sqrt(-c^2*x^2 +
 1)*b^2*d^3*x*arcsin(c*x)/c - 7/1152*(c^2*x^2 - 1)^3*b^2*d^3/c^2 + 35/512*s
qrt(-c^2*x^2 + 1)*a*b*d^3*x/c + 35/3072*(c^2*x^2 - 1)^2*b^2*d^3/c^2 + 35/10
24*b^2*d^3*arcsin(c*x)^2/c^2 - 35/1024*(c^2*x^2 - 1)*b^2*d^3/c^2 + 35/512*a
*b*d^3*arcsin(c*x)/c^2 - 7175/294912*b^2*d^3/c^2
```

3.178 $\int \left(d-c^2 d x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=298

$$\frac{1}{7} d^3 x \left(1-c^2 x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2+\frac{6}{35} d^3 x \left(1-c^2 x^2\right)^2 \left(a+b \sin^{-1}(cx)\right)^2+\frac{8}{35} d^3 x \left(1-c^2 x^2\right) \left(a+b \sin^{-1}(cx)\right)^2+\frac{2bd^3 (}{}$$

```
[Out] (-4322*b^2*d^3*x)/3675 + (1514*b^2*c^2*d^3*x^3)/11025 - (234*b^2*c^4*d^3*x^
5)/6125 + (2*b^2*c^6*d^3*x^7)/343 + (32*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcS
in[c*x]))/(35*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*
c) + (12*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d^3*
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c) + (16*d^3*x*(a + b*ArcSin[c
*x])^2)/35 + (8*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (6*d^3*x*(1
 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/35 + (d^3*x*(1 - c^2*x^2)^3*(a + b*Arc
Sin[c*x])^2)/7
```

Rubi [A] time = 0.371581, antiderivative size = 298, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4649, 4619, 4677, 8, 194}

$$\frac{1}{7} d^3 x \left(1-c^2 x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2+\frac{6}{35} d^3 x \left(1-c^2 x^2\right)^2 \left(a+b \sin^{-1}(cx)\right)^2+\frac{8}{35} d^3 x \left(1-c^2 x^2\right) \left(a+b \sin^{-1}(cx)\right)^2+\frac{2bd^3 (}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-4322*b^2*d^3*x)/3675 + (1514*b^2*c^2*d^3*x^3)/11025 - (234*b^2*c^4*d^3*x^
5)/6125 + (2*b^2*c^6*d^3*x^7)/343 + (32*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcS
in[c*x]))/(35*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*
c) + (12*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d^3*
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c) + (16*d^3*x*(a + b*ArcSin[c
*x])^2)/35 + (8*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (6*d^3*x*(1
 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/35 + (d^3*x*(1 - c^2*x^2)^3*(a + b*Arc
Sin[c*x])^2)/7
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
```

```
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{7}d^3x\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{7}(6d)\int \left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2$$
$$= \frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{49c}+\frac{6}{35}d^3x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+$$
$$= \frac{12bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{175c}+\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{49c}+$$
$$= -\frac{2}{49}b^2d^3x+\frac{2}{49}b^2c^2d^3x^3-\frac{6}{245}b^2c^4d^3x^5+\frac{2}{343}b^2c^6d^3x^7+\frac{16bd^3\left(1-c^2x^2\right)^{3/2}}{105}$$
$$= -\frac{962b^2d^3x}{3675}+\frac{1514b^2c^2d^3x^3}{11025}-\frac{234b^2c^4d^3x^5}{6125}+\frac{2}{343}b^2c^6d^3x^7+\frac{32bd^3\sqrt{1-c^2x^2}}{}$$
$$= -\frac{4322b^2d^3x}{3675}+\frac{1514b^2c^2d^3x^3}{11025}-\frac{234b^2c^4d^3x^5}{6125}+\frac{2}{343}b^2c^6d^3x^7+\frac{32bd^3\sqrt{1-c^2}}{}$$

Mathematica [A] time = 0.43053, size = 241, normalized size = 0.81

$$-\frac{d^3\left(11025a^2cx\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)+210ab\sqrt{1-c^2x^2}\left(75c^6x^6-351c^4x^4+757c^2x^2-2161\right)+210b\sin^{-1}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d^3*(2*b^2*c*x*(226905 - 26495*c^2*x^2 + 7371*c^4*x^4 - 1125*c^6*x^6) + 1
1025*a^2*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + 210*a*b*Sqrt[1 -
 c^2*x^2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 210*b*(105*a*c
*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-2161
 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6))*ArcSin[c*x] + 11025*b^2*c*x*(-3
5 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]^2))/(385875*c)
```

Maple [A] time = 0.042, size = 384, normalized size = 1.3

$$\frac{1}{c}\left(-d^3a^2\left(\frac{c^7x^7}{7}-\frac{3\,c^5x^5}{5}+c^3x^3-cx\right)-d^3b^2\left(\frac{(\arcsin(cx))^2\left(5\,c^6x^6-21\,c^4x^4+35\,c^2x^2-35\right)cx}{35}+\frac{32\,cx}{35}-\frac{32\,\arcsin}{35}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(-d^3*a^2*(1/7*c^7*x^7-3/5*c^5*x^5+c^3*x^3-c*x)-d^3*b^2*(1/35*arcsin(c*
x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+32/35*c*x-32/35*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)+2/49*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/1715*
(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x-12/175*arcsin(c*x)*(c^2*x^2-1)^2*(
-c^2*x^2+1)^(1/2)+4/875*(3*c^4*x^4-10*c^2*x^2+15)*c*x+16/105*arcsin(c*x)*(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)-16/315*(c^2*x^2-3)*c*x)-2*d^3*a*b*(1/7*arcsin(
c*x)*c^7*x^7-3/5*arcsin(c*x)*c^5*x^5+c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)+1/
49*c^6*x^6*(-c^2*x^2+1)^(1/2)-117/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)+757/3675*
c^2*x^2*(-c^2*x^2+1)^(1/2)-2161/3675*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] time = 1.70148, size = 984, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*b^2*c^6*d^3*x^7*arcsin(c*x)^2 - 1/7*a^2*c^6*d^3*x^7 + 3/5*b^2*c^4*d^3*
x^5*arcsin(c*x)^2 + 3/5*a^2*c^4*d^3*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sq
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^6*d^3 - 2/25725*(105*(5*s
qrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2
+ 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126
*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^6*d^3 - b^2*c^2*d^3*x^3*arcsin(
c*x)^2 + 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^4*d^3 + 2/375*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^4*d^3 - a^2*c^2*d^3*x^3 - 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d^3 - 2/9*(3*c*(sqrt(-c^2*x^2 +
 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*
b^2*c^2*d^3 + b^2*d^3*x*arcsin(c*x)^2 - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*a
rcsin(c*x)/c) + a^2*d^3*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^
3/c
```

Fricas [A] time = 1.93143, size = 759, normalized size = 2.55

$$-\frac{1125\left(49\,a^2-2\,b^2\right)c^7d^3x^7-189\left(1225\,a^2-78\,b^2\right)c^5d^3x^5+35\left(11025\,a^2-1514\,b^2\right)c^3d^3x^3-105\left(3675\,a^2-4322\,b^2\right)cd^3x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/385875*(1125*(49*a^2 - 2*b^2)*c^7*d^3*x^7 - 189*(1225*a^2 - 78*b^2)*c^5*
d^3*x^5 + 35*(11025*a^2 - 1514*b^2)*c^3*d^3*x^3 - 105*(3675*a^2 - 4322*b^2)
*c*d^3*x + 11025*(5*b^2*c^7*d^3*x^7 - 21*b^2*c^5*d^3*x^5 + 35*b^2*c^3*d^3*x
^3 - 35*b^2*c*d^3*x)*arcsin(c*x)^2 + 22050*(5*a*b*c^7*d^3*x^7 - 21*a*b*c^5*
d^3*x^5 + 35*a*b*c^3*d^3*x^3 - 35*a*b*c*d^3*x)*arcsin(c*x) + 210*(75*a*b*c^
6*d^3*x^6 - 351*a*b*c^4*d^3*x^4 + 757*a*b*c^2*d^3*x^2 - 2161*a*b*d^3 + (75*
b^2*c^6*d^3*x^6 - 351*b^2*c^4*d^3*x^4 + 757*b^2*c^2*d^3*x^2 - 2161*b^2*d^3)
```

```
*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] time = 21.1895, size = 524, normalized size = 1.76

$$\begin{cases} -\frac{a^2c^6d^3x^7}{7} + \frac{3a^2c^4d^3x^5}{5} - a^2c^2d^3x^3 + a^2d^3x - \frac{2abc^6d^3x^7\operatorname{asin}(cx)}{7} - \frac{2abc^5d^3x^6\sqrt{-c^2x^2+1}}{49} + \frac{6abc^4d^3x^5\operatorname{asin}(cx)}{5} + \frac{234abc^3d^3x^4\sqrt{-c^2x^2+1}}{1225} - \\ a^2d^3x \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**7/7 + 3*a**2*c**4*d**3*x**5/5 - a**2*c**2*d**
3*x**3 + a**2*d**3*x - 2*a*b*c**6*d**3*x**7*asin(c*x)/7 - 2*a*b*c**5*d**3*x
**6*sqrt(-c**2*x**2 + 1)/49 + 6*a*b*c**4*d**3*x**5*asin(c*x)/5 + 234*a*b*c*
*3*d**3*x**4*sqrt(-c**2*x**2 + 1)/1225 - 2*a*b*c**2*d**3*x**3*asin(c*x) - 1
514*a*b*c*d**3*x**2*sqrt(-c**2*x**2 + 1)/3675 + 2*a*b*d**3*x*asin(c*x) + 43
22*a*b*d**3*sqrt(-c**2*x**2 + 1)/(3675*c) - b**2*c**6*d**3*x**7*asin(c*x)**
2/7 + 2*b**2*c**6*d**3*x**7/343 - 2*b**2*c**5*d**3*x**6*sqrt(-c**2*x**2 + 1
)*asin(c*x)/49 + 3*b**2*c**4*d**3*x**5*asin(c*x)**2/5 - 234*b**2*c**4*d**3*
x**5/6125 + 234*b**2*c**3*d**3*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/1225 - b
**2*c**2*d**3*x**3*asin(c*x)**2 + 1514*b**2*c**2*d**3*x**3/11025 - 1514*b**
2*c*d**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/3675 + b**2*d**3*x*asin(c*x)**
2 - 4322*b**2*d**3*x/3675 + 4322*b**2*d**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
3675*c), Ne(c, 0)), (a**2*d**3*x, True))
```

Giac [B] time = 1.48575, size = 713, normalized size = 2.39

$$-\frac{1}{7}a^2c^6d^3x^7 + \frac{3}{5}a^2c^4d^3x^5 - \frac{1}{7}\left(c^2x^2-1\right)^3 b^2d^3x\arcsin(cx)^2 - a^2c^2d^3x^3 - \frac{2}{7}\left(c^2x^2-1\right)^3 abd^3x\arcsin(cx) + \frac{6}{35}\left(c^2x^2 - \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/7*a^2*c^6*d^3*x^7 + 3/5*a^2*c^4*d^3*x^5 - 1/7*(c^2*x^2 - 1)^3*b^2*d^3*x*
arcsin(c*x)^2 - a^2*c^2*d^3*x^3 - 2/7*(c^2*x^2 - 1)^3*a*b*d^3*x*arcsin(c*x)
 + 6/35*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2 + 2/343*(c^2*x^2 - 1)^3*b^2
*d^3*x + 12/35*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x) - 8/35*(c^2*x^2 - 1)*b
^2*d^3*x*arcsin(c*x)^2 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*ar
csin(c*x)/c - 888/42875*(c^2*x^2 - 1)^2*b^2*d^3*x - 16/35*(c^2*x^2 - 1)*a*b
*d^3*x*arcsin(c*x) + 16/35*b^2*d^3*x*arcsin(c*x)^2 - 2/49*(c^2*x^2 - 1)^3*s
qrt(-c^2*x^2 + 1)*a*b*d^3/c + 12/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2
*d^3*arcsin(c*x)/c + 30256/385875*(c^2*x^2 - 1)*b^2*d^3*x + 32/35*a*b*d^3*x
*arcsin(c*x) + 12/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c + 16/105
*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*arcsin(c*x)/c + a^2*d^3*x - 413312/385875*b^2
*d^3*x + 16/105*(-c^2*x^2 + 1)^(3/2)*a*b*d^3/c + 32/35*sqrt(-c^2*x^2 + 1)*b
^2*d^3*arcsin(c*x)/c + 32/35*sqrt(-c^2*x^2 + 1)*a*b*d^3/c
```

3.179 $\int \frac{(d-c^2dx^2)^3(a+b\sin^{-1}(cx))^2}{x}\,dx$

Optimal. Leaf size=354

$$-ibd^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}b^2d^3\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)$$

```
[Out] (71*b^2*c^2*d^3*x^2)/144 - (7*b^2*c^4*d^3*x^4)/144 - (b^2*d^3*(1 - c^2*x^2)
^3)/108 - (19*b*c*d^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/24 - (7*b*c*
d^3*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/36 - (b*c*d^3*x*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x]))/18 - (19*d^3*(a + b*ArcSin[c*x])^2)/48 + (d^3*
(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/6 - ((I/3)*d^3*(a
 + b*ArcSin[c*x])^3)/b + d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[
c*x])] - I*b*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] + (b
^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rubi [A] time = 0.658373, antiderivative size = 354, normalized size of antiderivative = 1., number of steps used = 26, number of rules used = 13, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.482, Rules used = {4699, 4625, 3717, 2190, 2531, 2282, 6589, 4647, 4641, 30, 4649, 14, 261}

$$-ibd^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}b^2d^3\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (71*b^2*c^2*d^3*x^2)/144 - (7*b^2*c^4*d^3*x^4)/144 - (b^2*d^3*(1 - c^2*x^2)
^3)/108 - (19*b*c*d^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/24 - (7*b*c*
d^3*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/36 - (b*c*d^3*x*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x]))/18 - (19*d^3*(a + b*ArcSin[c*x])^2)/48 + (d^3*
(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/6 - ((I/3)*d^3*(a
 + b*ArcSin[c*x])^3)/b + d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[
c*x])] - I*b*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] + (b
^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+d\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx-\frac{1}{3}\Big($$

$$= -\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{6}$$

$$= -\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{18}bcd^3x\left(1-c^2\right.$$

$$= -\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{7}{36}bcd^3x\left(1-c^2x^2\right.$$

$$= \frac{71}{144}b^2c^2d^3x^2-\frac{7}{144}b^2c^4d^3x^4-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\left(a+b\,\mathrm{si}\right.$$

$$= \frac{71}{144}b^2c^2d^3x^2-\frac{7}{144}b^2c^4d^3x^4-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\left(a+b\,\mathrm{si}\right.$$

$$= \frac{71}{144}b^2c^2d^3x^2-\frac{7}{144}b^2c^4d^3x^4-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\left(a+b\,\mathrm{si}\right.$$

$$= \frac{71}{144}b^2c^2d^3x^2-\frac{7}{144}b^2c^4d^3x^4-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\left(a+b\,\mathrm{si}\right.$$

$$= \frac{71}{144}b^2c^2d^3x^2-\frac{7}{144}b^2c^4d^3x^4-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\left(a+b\,\mathrm{si}\right.$$

Mathematica [A] time = 0.82619, size = 448, normalized size = 1.27

$$\frac{d^3\left(-3456iab\,\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+3456ib^2\sin^{-1}(cx)\mathrm{PolyLog}\left(2,e^{-2i\sin^{-1}(cx)}\right)+1728b^2\mathrm{PolyLog}\left(3,e^{-2i\sin^{-1}(cx)}\right)-5\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^3*((-144*I)*b^2*Pi^3 - 5184*a^2*c^2*x^2 + 2592*a^2*c^4*x^4 - 576*a^2*c^6
*x^6 - 3600*a*b*c*x*Sqrt[1 - c^2*x^2] + 1056*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]
```

```
- 192*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] + 3600*a*b*ArcSin[c*x] - 10368*a*b*c^2*
x^2*ArcSin[c*x] + 5184*a*b*c^4*x^4*ArcSin[c*x] - 1152*a*b*c^6*x^6*ArcSin[c*
x] - (3456*I)*a*b*ArcSin[c*x]^2 + (1152*I)*b^2*ArcSin[c*x]^3 - 783*b^2*Cos[
2*ArcSin[c*x]] + 1566*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 27*b^2*Cos[4*A
rcSin[c*x]] + 216*b^2*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] - b^2*Cos[6*ArcSin[c
*x]] + 18*b^2*ArcSin[c*x]^2*Cos[6*ArcSin[c*x]] + 3456*b^2*ArcSin[c*x]^2*Log
[1 - E^((-2*I)*ArcSin[c*x])] + 6912*a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin
[c*x])] + 3456*a^2*Log[c*x] + (3456*I)*b^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)
*ArcSin[c*x])] - (3456*I)*a*b*PolyLog[2, E^((2*I)*ArcSin[c*x])] + 1728*b^2*
PolyLog[3, E^((-2*I)*ArcSin[c*x])] - 1566*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]
] - 108*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]] - 6*b^2*ArcSin[c*x]*Sin[6*ArcSin
[c*x]]))/3456
```

Maple [B] time = 0.382, size = 743, normalized size = 2.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] -811/3456*d^3*b^2+25/48*b^2*c^2*d^3*x^2-11/144*b^2*c^4*d^3*x^4-I*d^3*a*b*ar
csin(c*x)^2-1/6*d^3*b^2*arcsin(c*x)^2*c^6*x^6+3/4*d^3*b^2*arcsin(c*x)^2*c^4
*x^4-3/2*d^3*b^2*arcsin(c*x)^2*c^2*x^2-2*I*d^3*b^2*arcsin(c*x)*polylog(2,-I
*c*x-(-c^2*x^2+1)^(1/2))-2*I*d^3*b^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+
1)^(1/2))+2*d^3*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*d^3*a*b*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*d^3*a*b*polylog(2,I*c*x+(-c^2*
x^2+1)^(1/2))-2*I*d^3*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-25/24*d^3*b^
2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-1/18*d^3*a*b*(-c^2*x^2+1)^(1/2)*c^5*x^
5+11/36*d^3*a*b*(-c^2*x^2+1)^(1/2)*c^3*x^3-25/24*d^3*a*b*(-c^2*x^2+1)^(1/2)
*c*x-1/3*d^3*a*b*arcsin(c*x)*c^6*x^6+3/2*d^3*a*b*arcsin(c*x)*c^4*x^4-3*d^3*
a*b*arcsin(c*x)*c^2*x^2-1/18*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5*x^5
+11/36*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^3+d^3*a^2*ln(c*x)+25/48
*d^3*b^2*arcsin(c*x)^2+2*d^3*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+2*d^3
*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+25/24*d^3*a*b*arcsin(c*x)+d^3*b^2*
arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+d^3*b^2*arcsin(c*x)^2*ln(1-I*c
*x-(-c^2*x^2+1)^(1/2))-1/3*I*d^3*b^2*arcsin(c*x)^3-1/6*d^3*a^2*c^6*x^6+3/4*
d^3*a^2*c^4*x^4-3/2*d^3*a^2*c^2*x^2+1/108*d^3*b^2*c^6*x^6
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{6}a^2c^6d^3x^6 + \frac{3}{4}a^2c^4d^3x^4 - \frac{3}{2}a^2c^2d^3x^2 + a^2d^3\log(x) - \int \frac{\left(b^2c^6d^3x^6 - 3\,b^2c^4d^3x^4 + 3\,b^2c^2d^3x^2 - b^2d^3\right)\arctan\left(cx, \sqrt{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/6*a^2*c^6*d^3*x^6 + 3/4*a^2*c^4*d^3*x^4 - 3/2*a^2*c^2*d^3*x^2 + a^2*d^3*
log(x) - integrate(((b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^
2 - b^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^6*d^3*
x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a*b*d^3)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2c^6d^3x^6 - 3\,a^2c^4d^3x^4 + 3\,a^2c^2d^3x^2 - a^2d^3 + \left(b^2c^6d^3x^6 - 3\,b^2c^4d^3x^4 + 3\,b^2c^2d^3x^2 - b^2d^3\right)\arcsin\left(cx\right)^2 + 2\,\left(ab\right.}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d^3\left(\int -\frac{a^2}{x}\,dx + \int 3a^2c^2x\,dx + \int -3a^2c^4x^3\,dx + \int a^2c^6x^5\,dx + \int -\frac{b^2\operatorname{asin}^2\left(cx\right)}{x}\,dx + \int -\frac{2ab\operatorname{asin}\left(cx\right)}{x}\,dx + \int 3b^2c^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x,x)
```

```
[Out] -d**3*(Integral(-a**2/x, x) + Integral(3*a**2*c**2*x, x) + Integral(-3*a**2
*c**4*x**3, x) + Integral(a**2*c**6*x**5, x) + Integral(-b**2*asin(c*x)**2/
x, x) + Integral(-2*a*b*asin(c*x)/x, x) + Integral(3*b**2*c**2*x*asin(c*x)*
*2, x) + Integral(-3*b**2*c**4*x**3*asin(c*x)**2, x) + Integral(b**2*c**6*x
**5*asin(c*x)**2, x) + Integral(6*a*b*c**2*x*asin(c*x), x) + Integral(-6*a*
b*c**4*x**3*asin(c*x), x) + Integral(2*a*b*c**6*x**5*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2 - d\right)^3\left(b\arcsin\left(cx\right) + a\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2/x, x)
```

3.180 $\int \frac{(d-c^2dx^2)^3(a+b\sin^{-1}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=329

$$2ib^2cd^3\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-2ib^2cd^3\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2-\frac{8}{5}c^2d^3x\,(1$$

```
[Out] (122*b^2*c^2*d^3*x)/25 - (14*b^2*c^4*d^3*x^3)/75 + (2*b^2*c^6*d^3*x^5)/125
- (22*b*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x]))/25 - (16*c^2*d^3*x*(a + b*ArcSin[c*x])^2)/5 - (8*c^2*d^3*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/5 - (6*c^2*d^3*x*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/5 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/x - 4*b*c*
d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^3*PolyLo
g[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^3*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rubi [A] time = 0.706098, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4695, 4649, 4619, 4677, 8, 194, 4699, 4697, 4709, 4183, 2279, 2391}

$$2ib^2cd^3\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-2ib^2cd^3\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2-\frac{8}{5}c^2d^3x\,(1$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^2,x]
```


```
[Out] (122*b^2*c^2*d^3*x)/25 - (14*b^2*c^4*d^3*x^3)/75 + (2*b^2*c^6*d^3*x^5)/125
- (22*b*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x]))/25 - (16*c^2*d^3*x*(a + b*ArcSin[c*x])^2)/5 - (8*c^2*d^3*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/5 - (6*c^2*d^3*x*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/5 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/x - 4*b*c*
d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^3*PolyLo
g[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^3*PolyLog[2, E^(I*ArcSin[c*x])]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
```

```
GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
```

```
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{x} - \left(6c^2d\right)\int \left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2$$

$$= \frac{2}{5}bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right) - \frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2 -$$

$$= \frac{2}{3}bcd^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{25}bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right) -$$

$$= -\frac{16}{15}b^2c^2d^3x + \frac{22}{45}b^2c^4d^3x^3 - \frac{2}{25}b^2c^6d^3x^5 + 2bcd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) -$$

$$= -\frac{38}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.$$

$$= \frac{122}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right.$$

$$= \frac{122}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right.$$

$$= \frac{122}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right.$$

Mathematica [A] time = 1.25003, size = 483, normalized size = 1.47

$$\frac{1}{720}d^3\left(1440ib^2c\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right) - 1440ib^2c\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right) - 144a^2c^6x^5 + 720a^2c^4x^3 - 2160a^2c^2x - \right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^3*((-720*a^2)/x - 2160*a^2*c^2*x + 3460*b^2*c^2*x + 720*a^2*c^4*x^3 - 14
4*a^2*c^6*x^5 - (17568*a*b*c*Sqrt[1 - c^2*x^2])/5 + (2016*a*b*c^3*x^2*Sqrt[
1 - c^2*x^2])/5 - (288*a*b*c^5*x^4*Sqrt[1 - c^2*x^2])/5 - (1440*a*b*ArcSin[
c*x])/x - 4320*a*b*c^2*x*ArcSin[c*x] + 1440*a*b*c^4*x^3*ArcSin[c*x] - 288*a
*b*c^6*x^5*ArcSin[c*x] - 3420*b^2*c*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - (720*b^
2*ArcSin[c*x]^2)/x - 1890*b^2*c^2*x*ArcSin[c*x]^2 - 1440*a*b*c*ArcTanh[Sqrt
[1 - c^2*x^2]] + 80*b^2*c^2*x*Cos[2*ArcSin[c*x]] - 360*b^2*c^2*x*ArcSin[c*x
]^2*Cos[2*ArcSin[c*x]] - 90*b^2*c*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - (18*b^2*
c*ArcSin[c*x]*Cos[5*ArcSin[c*x]])/5 + 1440*b^2*c*ArcSin[c*x]*Log[1 - E^(I*A
rcSin[c*x])] - 1440*b^2*c*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (1440*I)
```

```
*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])] - (1440*I)*b^2*c*PolyLog[2, E^(I*ArcS
in[c*x])] - 10*b^2*c*Sin[3*ArcSin[c*x]] + 45*b^2*c*ArcSin[c*x]^2*Sin[3*ArcS
in[c*x]] + (18*b^2*c*Sin[5*ArcSin[c*x]])/25 - 9*b^2*c*ArcSin[c*x]^2*Sin[5*A
rcSin[c*x]]))/720
```

Maple [A] time = 0.336, size = 535, normalized size = 1.6

$$-2\,cd^3ab\mathrm{Artanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)+2\,ib^2cd^3\mathrm{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)-2\,ib^2cd^3\mathrm{polylog}\left(2,icx+\sqrt{-c^2x^2+1}\right)+\frac{122}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] 2*I*b^2*c*d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*c*d^3*polylog(2,
I*c*x+(-c^2*x^2+1)^(1/2))+122/25*b^2*c^2*d^3*x-14/75*b^2*c^4*d^3*x^3+2/125*
b^2*c^6*d^3*x^5-d^3*a^2/x-1/5*d^3*b^2*arcsin(c*x)^2*c^6*x^5+d^3*b^2*arcsin(
c*x)^2*c^4*x^3-3*d^3*b^2*arcsin(c*x)^2*c^2*x-122/25*c*d^3*a*b*(-c^2*x^2+1)^
(1/2)-2*c*d^3*a*b*arctanh(1/(-c^2*x^2+1)^(1/2))-122/25*c*d^3*b^2*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)+2*c*d^3*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))
-2*c*d^3*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*d^3*a*b/x*arcsin(
c*x)-2/5*d^3*a*b*arcsin(c*x)*c^6*x^5+14/25*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)*c^3*x^2+2*d^3*a*b*c^4*x^3*arcsin(c*x)-6*d^3*a*b*c^2*x*arcsin(c*x)-2/
25*d^3*a*b*c^5*x^4*(-c^2*x^2+1)^(1/2)+14/25*d^3*a*b*c^3*x^2*(-c^2*x^2+1)^(1
/2)-2/25*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5*x^4-1/5*d^3*a^2*c^6*x^5
+d^3*a^2*c^4*x^3-3*d^3*a^2*c^2*x-d^3*b^2/x*arcsin(c*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{5}\,a^2c^6d^3x^5-\frac{2}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^6d^3+a^2c^4d^3x^3+\frac{2}{3}\left(3\,x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] -1/5*a^2*c^6*d^3*x^5 - 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4
/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^6*
d^3 + a^2*c^4*d^3*x^3 + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/
c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^4*d^3 - 3*b^2*c^2*d^3*x*arcsin(c*x)^
2 + 6*b^2*c^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) - 3*a^2*c^2*d^3*x
- 6*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d^3 - 2*(c*log(2*sqrt(-c^2
*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d^3 - a^2*d^3/x - 1/5*((b
^2*c^6*d^3*x^6 - 5*b^2*c^4*d^3*x^4 + 5*b^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 + 5*x*integrate(2/5*(b^2*c^7*d^3*x^6 - 5*b^2*c^5*d^3*x^4
+ 5*b^2*c*d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))/(c^2*x^3 - x), x))/x
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{a^2c^6d^3x^6-3\,a^2c^4d^3x^4+3\,a^2c^2d^3x^2-a^2d^3+\left(b^2c^6d^3x^6-3\,b^2c^4d^3x^4+3\,b^2c^2d^3x^2-b^2d^3\right)\arcsin\left(cx\right)^2+2\left(ab\right.}{x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d^3\left(\int 3a^2c^2\,dx + \int -\frac{a^2}{x^2}\,dx + \int -3a^2c^4x^2\,dx + \int a^2c^6x^4\,dx + \int 3b^2c^2\operatorname{asin}^2(cx)\,dx + \int -\frac{b^2\operatorname{asin}^2(cx)}{x^2}\,dx + \int 6a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] -d**3*(Integral(3*a**2*c**2, x) + Integral(-a**2/x**2, x) + Integral(-3*a**
2*c**4*x**2, x) + Integral(a**2*c**6*x**4, x) + Integral(3*b**2*c**2*asin(c
*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**2, x) + Integral(6*a*b*c**2*asi
n(c*x), x) + Integral(-2*a*b*asin(c*x)/x**2, x) + Integral(-3*b**2*c**4*x**
2*asin(c*x)**2, x) + Integral(b**2*c**6*x**4*asin(c*x)**2, x) + Integral(-6
*a*b*c**4*x**2*asin(c*x), x) + Integral(2*a*b*c**6*x**4*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\text{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

3.181 $\int \frac{(d-c^2dx^2)^3(a+b\sin^{-1}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=371

$$3ibc^2d^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-\frac{3}{2}b^2c^2d^3\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.$$

```
[Out] (-21*b^2*c^4*d^3*x^2)/32 + (b^2*c^6*d^3*x^4)/32 + (3*b*c^3*d^3*x*Sqrt[1 - c
^2*x^2]*(a + b*ArcSin[c*x]))/16 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x]))/8 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x + (3
*c^2*d^3*(a + b*ArcSin[c*x])^2)/32 - (3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/2 - (3*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - (d^3*(1
 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(2*x^2) + (I*c^2*d^3*(a + b*ArcSin[c*x
])^3)/b - 3*c^2*d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*x])] +
b^2*c^2*d^3*Log[x] + (3*I)*b*c^2*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I
)*ArcSin[c*x])] - (3*b^2*c^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rubi [A] time = 0.722516, antiderivative size = 371, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4695, 4699, 4625, 3717, 2190, 2531, 2282, 6589, 4647, 4641, 30, 4649, 14, 266, 43}

$$3ibc^2d^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-\frac{3}{2}b^2c^2d^3\text{PolyLog}\left(3,e^{2i\sin^{-1}(cx)}\right)-\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (-21*b^2*c^4*d^3*x^2)/32 + (b^2*c^6*d^3*x^4)/32 + (3*b*c^3*d^3*x*Sqrt[1 - c
^2*x^2]*(a + b*ArcSin[c*x]))/16 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x]))/8 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x + (3
*c^2*d^3*(a + b*ArcSin[c*x])^2)/32 - (3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/2 - (3*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - (d^3*(1
 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(2*x^2) + (I*c^2*d^3*(a + b*ArcSin[c*x
])^3)/b - 3*c^2*d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*x])] +
b^2*c^2*d^3*Log[x] + (3*I)*b*c^2*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I
)*ArcSin[c*x])] - (3*b^2*c^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
```

```
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{x^3}dx = -\frac{d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} - \left(3c^2d\right)\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x}$$

$$= -\frac{bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x} - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2 -$$

$$= -\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x}$$

$$= \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{7}{8}bc^3d^3x$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{7}{8}bc^3d^3x$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{7}{8}bc^3d^3x$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{7}{8}bc^3d^3x$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{7}{8}bc^3d^3x$$

Mathematica [A] time = 1.38496, size = 494, normalized size = 1.33

$$\frac{1}{256}d^3\left(768iabc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) - 768ib^2c^2\sin^{-1}(cx)\text{PolyLog}\left(2,e^{-2i\sin^{-1}(cx)}\right) - 384b^2c^2\text{PolyLog}\left(3,e^{-2i\sin^{-1}}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d^3*((32*I)*b^2*c^2*Pi^3 - (128*a^2)/x^2 + 384*a^2*c^4*x^2 - 64*a^2*c^6*x^
4 - (256*a*b*c*Sqrt[1 - c^2*x^2])/x + 336*a*b*c^3*x*Sqrt[1 - c^2*x^2] - 32*
a*b*c^5*x^3*Sqrt[1 - c^2*x^2] - 336*a*b*c^2*ArcSin[c*x] - (256*a*b*ArcSin[c
*x])/x^2 + 768*a*b*c^4*x^2*ArcSin[c*x] - 128*a*b*c^6*x^4*ArcSin[c*x] - (256
*b^2*c*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/x + (768*I)*a*b*c^2*ArcSin[c*x]^2 - (
128*b^2*ArcSin[c*x]^2)/x^2 - (256*I)*b^2*c^2*ArcSin[c*x]^3 + 80*b^2*c^2*Cos
[2*ArcSin[c*x]] - 160*b^2*c^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + b^2*c^2*Co
s[4*ArcSin[c*x]] - 8*b^2*c^2*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] - 768*b^2*c^2
*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] - 1536*a*b*c^2*ArcSin[c*x]*L
og[1 - E^((2*I)*ArcSin[c*x])] - 768*a^2*c^2*Log[x] + 256*b^2*c^2*Log[c*x] -
 (768*I)*b^2*c^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (768*I)*a
*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])] - 384*b^2*c^2*PolyLog[3, E^((-2*I)
*ArcSin[c*x])] + 160*b^2*c^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 4*b^2*c^2*Arc
Sin[c*x]*Sin[4*ArcSin[c*x]]))/256
```

Maple [B] time = 0.682, size = 888, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x)
```

```
[Out] 21/16*c^3*d^3*a*b*(-c^2*x^2+1)^(1/2)*x-1/2*c^6*d^3*a*b*arcsin(c*x)*x^4+3*c^
4*d^3*a*b*arcsin(c*x)*x^2-c*d^3*b^2*arcsin(c*x)/x*(-c^2*x^2+1)^(1/2)-c*d^3*
a*b/x*(-c^2*x^2+1)^(1/2)-6*c^2*d^3*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))-6*c^2*d^3*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+6*I*c^2*d^3
*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+6*I*c^2*d^3*b^2*arcsin(c*x)*polylo
g(2,-I*c*x-(-c^2*x^2+1)^(1/2))+6*I*c^2*d^3*b^2*arcsin(c*x)*polylog(2,I*c*x+
(-c^2*x^2+1)^(1/2))+6*I*c^2*d^3*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+3*
I*c^2*d^3*a*b*arcsin(c*x)^2-1/8*c^5*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*
x^3+21/16*c^3*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-1/8*c^5*d^3*a*b*(-c^
2*x^2+1)^(1/2)*x^3+81/256*d^3*b^2*c^2-1/2*d^3*a^2/x^2-21/32*b^2*c^4*d^3*x^2
+1/32*b^2*c^6*d^3*x^4-1/4*c^6*d^3*a^2*x^4+3/2*c^4*d^3*a^2*x^2-3*c^2*d^3*a^2
*ln(c*x)-21/32*c^2*d^3*b^2*arcsin(c*x)^2-6*c^2*d^3*b^2*polylog(3,-I*c*x-(-c
^2*x^2+1)^(1/2))-6*c^2*d^3*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-2*c^2*d^
3*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2))+c^2*d^3*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-
1)+c^2*d^3*b^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/2*d^3*b^2*arcsin(c*x)^2/x^2
+I*c^2*d^3*b^2*arcsin(c*x)+I*c^2*d^3*b^2*arcsin(c*x)^3-21/16*c^2*d^3*a*b*ar
csin(c*x)-3*c^2*d^3*b^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*c^2*
d^3*b^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/4*c^6*d^3*b^2*arcsin
(c*x)^2*x^4+3/2*c^4*d^3*b^2*arcsin(c*x)^2*x^2+I*c^2*d^3*a*b-d^3*a*b*arcsin(
c*x)/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a^2c^6d^3x^4 + \frac{3}{2}a^2c^4d^3x^2 - 3a^2c^2d^3\log(x) - abd^3\left(\frac{\sqrt{-c^2x^2+1}c}{x} + \frac{\arcsin(cx)}{x^2}\right) - \frac{a^2d^3}{2x^2} - \int \frac{\left(b^2c^6d^3x^6 - 3b^2c^4d^3x^4 + 3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*c^6*d^3*x^4 + 3/2*a^2*c^4*d^3*x^2 - 3*a^2*c^2*d^3*log(x) - a*b*d^3
*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a^2*d^3/x^2 - integrate((
(b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*
x^4 + 3*a*b*c^2*d^3*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/x^3, x
)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2c^6d^3x^6 - 3a^2c^4d^3x^4 + 3a^2c^2d^3x^2 - a^2d^3 + \left(b^2c^6d^3x^6 - 3b^2c^4d^3x^4 + 3b^2c^2d^3x^2 - b^2d^3\right)\arcsin(cx)^2 + 2\left(ab\right.}{x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d^3\left(\int -\frac{a^2}{x^3}\,dx + \int \frac{3a^2c^2}{x}\,dx + \int -3a^2c^4x\,dx + \int a^2c^6x^3\,dx + \int -\frac{b^2\operatorname{asin}^2(cx)}{x^3}\,dx + \int -\frac{2ab\operatorname{asin}(cx)}{x^3}\,dx + \int \frac{3b^2}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] -d**3*(Integral(-a**2/x**3, x) + Integral(3*a**2*c**2/x, x) + Integral(-3*a
**2*c**4*x, x) + Integral(a**2*c**6*x**3, x) + Integral(-b**2*asin(c*x)**2/
x**3, x) + Integral(-2*a*b*asin(c*x)/x**3, x) + Integral(3*b**2*c**2*asin(c
*x)**2/x, x) + Integral(-3*b**2*c**4*x*asin(c*x)**2, x) + Integral(b**2*c**
6*x**3*asin(c*x)**2, x) + Integral(6*a*b*c**2*asin(c*x)/x, x) + Integral(-6
*a*b*c**4*x*asin(c*x), x) + Integral(2*a*b*c**6*x**3*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2 - d\right)^3 (b\arcsin(cx) + a)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2/x^3, x)
```

3.182 $\int \frac{(d-c^2dx^2)^3(a+b\sin^{-1}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=348

$$-\frac{17}{3}ib^2c^3d^3\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+\frac{17}{3}ib^2c^3d^3\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\frac{8}{3}c^4d^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2-\frac{1}{9}bc^3d^3$$

```
[Out] -(b^2*c^2*d^3)/(3*x) - (50*b^2*c^4*d^3*x)/9 + (2*b^2*c^6*d^3*x^3)/27 + 5*b*
c^3*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (b*c^3*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x]))/9 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(3*x^2) + (16*c^4*d^3*x*(a + b*ArcSin[c*x])^2)/3 + (8*c^4*d^3*x*(1 - c^
2*x^2)*(a + b*ArcSin[c*x])^2)/3 + (2*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[
c*x])^2)/x - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(3*x^3) + (34*b*c^
3*d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((17*I)/3)*b^2*c^
3*d^3*PolyLog[2, -E^(I*ArcSin[c*x])] + ((17*I)/3)*b^2*c^3*d^3*PolyLog[2, E^
(I*ArcSin[c*x])]
```

Rubi [A] time = 0.981233, antiderivative size = 348, normalized size of antiderivative = 1., number of steps used = 31, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4695, 4649, 4619, 4677, 8, 4699, 4697, 4709, 4183, 2279, 2391, 270}

$$-\frac{17}{3}ib^2c^3d^3\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+\frac{17}{3}ib^2c^3d^3\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\frac{8}{3}c^4d^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2-\frac{1}{9}bc^3d^3$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -(b^2*c^2*d^3)/(3*x) - (50*b^2*c^4*d^3*x)/9 + (2*b^2*c^6*d^3*x^3)/27 + 5*b*
c^3*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (b*c^3*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x]))/9 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(3*x^2) + (16*c^4*d^3*x*(a + b*ArcSin[c*x])^2)/3 + (8*c^4*d^3*x*(1 - c^
2*x^2)*(a + b*ArcSin[c*x])^2)/3 + (2*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[
c*x])^2)/x - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(3*x^3) + (34*b*c^
3*d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((17*I)/3)*b^2*c^
3*d^3*PolyLog[2, -E^(I*ArcSin[c*x])] + ((17*I)/3)*b^2*c^3*d^3*PolyLog[2, E^
(I*ArcSin[c*x])]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
```

```
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx = -\frac{d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{3x^3} - \left(2c^2d\right)\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx$$

$$= -\frac{bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} + \frac{2c^2d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x} - \frac{d^3}{}$$

$$= -\frac{17}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} +$$

$$= -\frac{b^2c^2d^3}{3x} + \frac{11}{9}b^2c^4d^3x - \frac{14}{27}b^2c^6d^3x^3 - \frac{17}{3}bc^3d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{9}bc$$

$$= -\frac{b^2c^2d^3}{3x} + \frac{46}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{9}bc^3$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{9}bc^3$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{9}bc^3$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{1}{9}bc^3$$

Mathematica [A] time = 0.998796, size = 480, normalized size = 1.38

$$-\frac{d^3\left(153ib^2c^3x^3\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right) - 153ib^2c^3x^3\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right) + 9a^2c^6x^6 - 81a^2c^4x^4 - 81a^2c^2x^2 + 9a^2 + 6\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -(d^3*(9*a^2 - 81*a^2*c^2*x^2 + 9*b^2*c^2*x^2 - 81*a^2*c^4*x^4 + 150*b^2*c^
4*x^4 + 9*a^2*c^6*x^6 - 2*b^2*c^6*x^6 + 9*a*b*c*x*Sqrt[1 - c^2*x^2] - 150*a
*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 6*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] + 18*a*b*Arc
Sin[c*x] - 162*a*b*c^2*x^2*ArcSin[c*x] - 162*a*b*c^4*x^4*ArcSin[c*x] + 18*a
*b*c^6*x^6*ArcSin[c*x] + 9*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 150*b^2*
c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 6*b^2*c^5*x^5*Sqrt[1 - c^2*x^2]*Arc
```

```
Sin[c*x] + 9*b^2*ArcSin[c*x]^2 - 81*b^2*c^2*x^2*ArcSin[c*x]^2 - 81*b^2*c^4*
x^4*ArcSin[c*x]^2 + 9*b^2*c^6*x^6*ArcSin[c*x]^2 - 153*a*b*c^3*x^3*ArcTanh[S
qrt[1 - c^2*x^2]] + 153*b^2*c^3*x^3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]
- 153*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (153*I)*b^2*c^3*
x^3*PolyLog[2, -E^(I*ArcSin[c*x])] - (153*I)*b^2*c^3*x^3*PolyLog[2, E^(I*Ar
cSin[c*x])]))/(27*x^3)
```

Maple [A] time = 0.526, size = 547, normalized size = 1.6

$$\frac{17\,c^3d^3ab}{3}\mathrm{Artanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)-\frac{17\,i}{3}b^2c^3d^3\mathrm{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)+\frac{17\,i}{3}b^2c^3d^3\mathrm{polylog}\left(2,icx+\sqrt{-c^2x^2+\dots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x)
```

```
[Out] -17/3*I*b^2*c^3*d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+17/3*I*b^2*c^3*d^3
*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+6*c^2*d^3*a*b/x*arcsin(c*x)-2/9*c^5*d^
3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2-2/9*c^5*d^3*a*b*x^2*(-c^2*x^2+1)^(
1/2)-1/3*c*d^3*a*b/x^2*(-c^2*x^2+1)^(1/2)-2/3*c^6*d^3*a*b*x^3*arcsin(c*x)+6
*c^4*d^3*a*b*x*arcsin(c*x)-1/3*c*d^3*b^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
-1/3*b^2*c^2*d^3/x-50/9*b^2*c^4*d^3*x+2/27*b^2*c^6*d^3*x^3-1/3*d^3*a^2/x^3+
3*c^2*d^3*b^2/x*arcsin(c*x)^2-1/3*c^6*d^3*b^2*arcsin(c*x)^2*x^3+50/9*c^3*d^
3*a*b*(-c^2*x^2+1)^(1/2)+17/3*c^3*d^3*a*b*arctanh(1/(-c^2*x^2+1)^(1/2))+50/
9*c^3*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-17/3*c^3*d^3*b^2*arcsin(c*x)*l
n(1-I*c*x-(-c^2*x^2+1)^(1/2))+17/3*c^3*d^3*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2
*x^2+1)^(1/2))+3*c^4*d^3*b^2*arcsin(c*x)^2*x-2/3*d^3*a*b*arcsin(c*x)/x^3-1/
3*c^6*d^3*a^2*x^3+3*c^4*d^3*a^2*x+3*c^2*d^3*a^2/x-1/3*d^3*b^2/x^3*arcsin(c*
x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{3}a^2c^6d^3x^3-\frac{2}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abc^6d^3+3\,b^2c^4d^3x\arcsin\left(cx\right)^2-6\,b^2c^4d^3\left(x-\dots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*a^2*c^6*d^3*x^3 - 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^6*d^3 + 3*b^2*c^4*d^3*x*arcsin(c*x)^2
 - 6*b^2*c^4*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + 3*a^2*c^4*d^3*x +
 6*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c^3*d^3 + 6*(c*log(2*sqrt(-c^
2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*c^2*d^3 - 1/3*((c^2*log(
2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c + 2*arc
sin(c*x)/x^3)*a*b*d^3 + 3*a^2*c^2*d^3/x - 1/3*a^2*d^3/x^3 - 1/3*(3*x^3*inte
grate(2/3*(b^2*c^7*d^3*x^6 - 9*b^2*c^3*d^3*x^2 + b^2*c*d^3)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 - x^3), x
) + (b^2*c^6*d^3*x^6 - 9*b^2*c^2*d^3*x^2 + b^2*d^3)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))^2)/x^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2c^6d^3x^6 - 3\,a^2c^4d^3x^4 + 3\,a^2c^2d^3x^2 - a^2d^3 + \left(b^2c^6d^3x^6 - 3\,b^2c^4d^3x^4 + 3\,b^2c^2d^3x^2 - b^2d^3\right)\arcsin\left(cx\right)^2 + 2\left(ab\right.}{x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d^3\left(\int -3a^2c^4\,dx + \int -\frac{a^2}{x^4}\,dx + \int \frac{3a^2c^2}{x^2}\,dx + \int a^2c^6x^2\,dx + \int -3b^2c^4\,\mathrm{asin}^2\left(cx\right)dx + \int -\frac{b^2\,\mathrm{asin}^2\left(cx\right)}{x^4}\,dx + \int -6abc\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] -d**3*(Integral(-3*a**2*c**4, x) + Integral(-a**2/x**4, x) + Integral(3*a**
2*c**2/x**2, x) + Integral(a**2*c**6*x**2, x) + Integral(-3*b**2*c**4*asin(
c*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**4, x) + Integral(-6*a*b*c**4*a
sin(c*x), x) + Integral(-2*a*b*asin(c*x)/x**4, x) + Integral(3*b**2*c**2*as
in(c*x)**2/x**2, x) + Integral(b**2*c**6*x**2*asin(c*x)**2, x) + Integral(6
*a*b*c**2*asin(c*x)/x**2, x) + Integral(2*a*b*c**6*x**2*asin(c*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\text{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

3.183 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=297

$$\frac{2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d}-\frac{2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d}-\frac{2b^2\text{PolyLog}\left(3,-ie^{i\,\mathrm{s}}\right.}{c^5d}$$

```
[Out] (22*b^2*x)/(9*c^4*d) + (2*b^2*x^3)/(27*c^2*d) - (22*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(9*c^5*d) - (2*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(9*c^3*d) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d) - (x^3*(a + b*ArcSin[c*x])
^2)/(3*c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^
5*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^
5*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d
) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^5*d) + (2*b^2*PolyLog[3,
I*E^(I*ArcSin[c*x])])/(c^5*d)
```

Rubi [A] time = 0.549021, antiderivative size = 297, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.37, Rules used = {4715, 4657, 4181, 2531, 2282, 6589, 4677, 8, 4707, 30}

$$\frac{2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d}-\frac{2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d}-\frac{2b^2\text{PolyLog}\left(3,-ie^{i\,\mathrm{s}}\right.}{c^5d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] (22*b^2*x)/(9*c^4*d) + (2*b^2*x^3)/(27*c^2*d) - (22*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(9*c^5*d) - (2*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(9*c^3*d) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d) - (x^3*(a + b*ArcSin[c*x])
^2)/(3*c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^
5*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^
5*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d
) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^5*d) + (2*b^2*PolyLog[3,
I*E^(I*ArcSin[c*x])])/(c^5*d)
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^4 \left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx = -\frac{x^3 \left(a+b\sin^{-1}(cx)\right)^2}{3c^2d} + \frac{\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}dx}{c^2} + \frac{(2b)\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}dx}{3cd}$$

$$= -\frac{2bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3d} - \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^4d} - \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d} + \int \frac{(a+}{}$$

$$= \frac{2b^2x^3}{27c^2d} - \frac{22b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3d} - \frac{x\left(a+b\sin\right.}{c^4}$$

$$= \frac{22b^2x}{9c^4d} + \frac{2b^2x^3}{27c^2d} - \frac{22b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3d} - $$

$$= \frac{22b^2x}{9c^4d} + \frac{2b^2x^3}{27c^2d} - \frac{22b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3d} - $$

$$= \frac{22b^2x}{9c^4d} + \frac{2b^2x^3}{27c^2d} - \frac{22b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3d} - $$

$$= \frac{22b^2x}{9c^4d} + \frac{2b^2x^3}{27c^2d} - \frac{22b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3d} - $$

Mathematica [A] time = 0.824935, size = 508, normalized size = 1.71

$$-\frac{-216ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+216ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+216b^2\text{PolyLog}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -(108*a^2*c*x - 270*b^2*c*x + 36*a^2*c^3*x^3 + 264*a*b*Sqrt[1 - c^2*x^2] +
24*a*b*c^2*x^2*Sqrt[1 - c^2*x^2] + (108*I)*a*b*Pi*ArcSin[c*x] + 216*a*b*c*x
*ArcSin[c*x] + 72*a*b*c^3*x^3*ArcSin[c*x] + 270*b^2*Sqrt[1 - c^2*x^2]*ArcSi
n[c*x] + 135*b^2*c*x*ArcSin[c*x]^2 - 6*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]] -
 108*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 216*a*b*ArcSin[c*x]*Log[1 - I*E^
(I*ArcSin[c*x])] - 108*b^2*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] - 108
*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 216*a*b*ArcSin[c*x]*Log[1 + I*E^(I*A
rcSin[c*x])] + 108*b^2*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 54*a^2*
Log[1 - c*x] - 54*a^2*Log[1 + c*x] + 108*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x
])/4]] + 108*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (216*I)*b*(a + b*Arc
Sin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (216*I)*b*(a + b*ArcSin[c*x]
)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 216*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x
])] - 216*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])] + 2*b^2*Sin[3*ArcSin[c*x]] -
9*b^2*ArcSin[c*x]^2*Sin[3*ArcSin[c*x]])/(108*c^5*d)
```

Maple [F] time = 0.418, size = 0, normalized size = 0.

$$\int \frac{x^4\left(a+b\arcsin(cx)\right)^2}{-c^2dx^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{6}\,a^2\left(\frac{2\left(c^2x^3+3\,x\right)}{c^4d}-\frac{3\,\log\left(cx+1\right)}{c^5d}+\frac{3\,\log\left(cx-1\right)}{c^5d}\right)+\frac{-2\,c^5d\int\frac{6\,abc^4x^4\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)-\left(3\,b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/6*a^2*(2*(c^2*x^3 + 3*x)/(c^4*d) - 3*log(c*x + 1)/(c^5*d) + 3*log(c*x -
1)/(c^5*d)) + 1/6*(6*c^5*d*integrate(-1/3*(6*a*b*c^4*x^4*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)) - (3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)*log(c*x + 1) - 3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x
+ 1) - 2*(b^2*c^3*x^3 + 3*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d*x^2 - c^4*d), x) + 3*b^2*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*b^2*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(b^2*c^3*x^3 + 3*b^2*c*x)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/(c^5*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2x^4\arcsin\left(cx\right)^2+2\,abx^4\arcsin\left(cx\right)+a^2x^4}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^2*d*
x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a^2x^4}{c^2x^2-1}\,dx+\int\frac{b^2x^4\operatorname{asin}^2\left(cx\right)}{c^2x^2-1}\,dx+\int\frac{2abx^4\operatorname{asin}\left(cx\right)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**4/(c**2*x**2 - 1), x) + Integral(b**2*x**4*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**4*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int-\frac{\left(b\arcsin\left(cx\right)+a\right)^2x^4}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d), x)
```

3.184 $\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=210

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}-\frac{bx\sqrt{1-c^2x^2}\left(a+b\right.}{2c^3d}$$

```
[Out] (b^2*x^2)/(4*c^2*d) - (b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c^3*d)
 + (a + b*ArcSin[c*x])^2/(4*c^4*d) - (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d)
+ ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d) - ((a + b*ArcSin[c*x])^2*Log[1 +
E^((2*I)*ArcSin[c*x])])/(c^4*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((
2*I)*ArcSin[c*x])])/(c^4*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c
^4*d)
```

Rubi [A] time = 0.37787, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.37, Rules used = {4715, 4675, 3719, 2190, 2531, 2282, 6589, 4707, 4641, 30}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}-\frac{bx\sqrt{1-c^2x^2}\left(a+b\right.}{2c^3d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```


```
[Out] (b^2*x^2)/(4*c^2*d) - (b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c^3*d)
 + (a + b*ArcSin[c*x])^2/(4*c^4*d) - (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d)
+ ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d) - ((a + b*ArcSin[c*x])^2*Log[1 +
E^((2*I)*ArcSin[c*x])])/(c^4*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((
2*I)*ArcSin[c*x])])/(c^4*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c
^4*d)
```


Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
```

```
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx = -\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx}{c^2}+\frac{b\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{cd}$$

$$= -\frac{bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{\text{Subst}\left(\int(a+bx)^2\tan(x)\,dx,x,\text{s}\right.}{c^4d}$$

$$= \frac{b^2x^2}{4c^2d}-\frac{bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{i\left(a+\right.}{}$$

$$= \frac{b^2x^2}{4c^2d}-\frac{bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{i\left(a+\right.}{}$$

$$= \frac{b^2x^2}{4c^2d}-\frac{bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{i\left(a+\right.}{}$$

$$= \frac{b^2x^2}{4c^2d}-\frac{bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{i\left(a+\right.}{}$$

$$= \frac{b^2x^2}{4c^2d}-\frac{bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d}-\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{i\left(a+\right.}{}$$

Mathematica [B] time = 0.397319, size = 441, normalized size = 2.1

$$-\frac{-48iab\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-48iab\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)-24ib^2\sin^{-1}(cx)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+12b^2\text{Poly}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -(12*a^2*c^2*x^2 + 12*a*b*c*x*Sqrt[1 - c^2*x^2] - 12*a*b*ArcSin[c*x] + (48*
I)*a*b*Pi*ArcSin[c*x] + 24*a*b*c^2*x^2*ArcSin[c*x] - (24*I)*a*b*ArcSin[c*x]
^2 - (8*I)*b^2*ArcSin[c*x]^3 + 3*b^2*Cos[2*ArcSin[c*x]] - 6*b^2*ArcSin[c*x]
^2*Cos[2*ArcSin[c*x]] + 96*a*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 24*a*b*Pi
*Log[1 - I*E^(I*ArcSin[c*x])] + 48*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*
x])] - 24*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 48*a*b*ArcSin[c*x]*Log[1 +
I*E^(I*ArcSin[c*x])] + 24*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])]
+ 12*a^2*Log[1 - c^2*x^2] - 96*a*b*Pi*Log[Cos[ArcSin[c*x]/2]] + 24*a*b*Pi*L
og[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 24*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4
]] - (48*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (48*I)*a*b*PolyLog[2,
I*E^(I*ArcSin[c*x])] - (24*I)*b^2*ArcSin[c*x]*PolyLog[2, -E^((2*I)*ArcSin[c
*x])] + 12*b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])] + 6*b^2*ArcSin[c*x]*Sin[2
*ArcSin[c*x]])/(24*c^4*d)
```

Maple [A] time = 0.243, size = 416, normalized size = 2.

$$-\frac{a^2x^2}{2\,c^2d}-\frac{a^2\ln(cx-1)}{2\,dc^4}-\frac{a^2\ln(cx+1)}{2\,dc^4}+\frac{\frac{i}{3}b^2\left(\arcsin(cx)\right)^3}{dc^4}-\frac{b^2\arcsin(cx)\,x}{2\,dc^3}\sqrt{-c^2x^2+1}-\frac{b^2\left(\arcsin(cx)\right)^2x^2}{2\,c^2d}+\frac{b^2\left(\text{ar}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2/c^2*a^2/d*x^2-1/2/c^4*a^2/d*ln(c*x-1)-1/2/c^4*a^2/d*ln(c*x+1)+1/3*I/c^
4*b^2/d*arcsin(c*x)^3-1/2/c^3*b^2/d*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-1/2/c^
2*b^2/d*arcsin(c*x)^2*x^2+1/4/c^4*b^2/d*arcsin(c*x)^2+1/4*b^2*x^2/c^2/d-1/8
/c^4*b^2/d-1/c^4*b^2/d*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I/c
^4*a*b/d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2*polylog(3,-(I*c*x
+(-c^2*x^2+1)^(1/2))^2)/c^4/d+I/c^4*a*b/d*arcsin(c*x)^2-1/2/c^3*a*b/d*(-c^2
*x^2+1)^(1/2)*x-1/c^2*a*b/d*arcsin(c*x)*x^2+1/2/c^4*a*b/d*arcsin(c*x)-2/c^4
*a*b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I/c^4*b^2/d*arcsin(c*
x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2x^3\arcsin(cx)^2 + 2\,abx^3\arcsin(cx) + a^2x^3}{c^2dx^2 - d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)/(c^2*d*
x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a^2x^3}{c^2x^2-1}\,dx + \int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx^3\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**3/(c**2*x**2 - 1), x) + Integral(b**2*x**3*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**3*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx) + a)^2x^3}{c^2dx^2 - d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")

[Out] integrate(-(b*arcsin(c*x) + a)^2*x^3/(c^2*d*x^2 - d), x)
```

3.185 $\int \frac{x^2(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=218

$$\frac{2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{2b^2\text{PolyLog}\left(3,-ie^{i\sin}\right.}{c^3d}$$

```
[Out] (2*b^2*x)/(c^2*d) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^3*d) - (
x*(a + b*ArcSin[c*x])^2)/(c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/(c^3*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c^3*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^3*d) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^3*d) +
 (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d)
```

Rubi [A] time = 0.286929, antiderivative size = 218, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4715, 4657, 4181, 2531, 2282, 6589, 4677, 8}

$$\frac{2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{2b^2\text{PolyLog}\left(3,-ie^{i\sin}\right.}{c^3d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```



```
[Out] (2*b^2*x)/(c^2*d) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^3*d) - (
x*(a + b*ArcSin[c*x])^2)/(c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/(c^3*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c^3*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^3*d) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^3*d) +
 (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d)
```


Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx = -\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}+\frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx}{c^2}+\frac{(2b)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{cd}$$

$$= -\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}+\frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx,x,\text{si}\right.}{c^3d}$$

$$= \frac{2b^2x}{c^2d}-\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}-\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(\right.}{c^3d}$$

$$= \frac{2b^2x}{c^2d}-\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}-\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(\right.}{c^3d}$$

$$= \frac{2b^2x}{c^2d}-\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}-\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(\right.}{c^3d}$$

$$= \frac{2b^2x}{c^2d}-\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d}-\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}-\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(\right.}{c^3d}$$

Mathematica [A] time = 0.303531, size = 317, normalized size = 1.45

$$-\frac{-4ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+4ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+4b^2\text{PolyLog}\left(3,-i\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -(2*a^2*c*x - 4*b^2*c*x + 4*a*b*Sqrt[1 - c^2*x^2] + 4*a*b*c*x*ArcSin[c*x] +
 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 2*b^2*c*x*ArcSin[c*x]^2 - 4*a*b*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b^2*ArcSin[c*x]^2*Log[1 - I*E^(I*A
rcSin[c*x])] + 4*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b^2*ArcSi
n[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + a^2*Log[1 - c*x] - a^2*Log[1 + c*x]
 - (4*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*b
*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] + 4*b^2*PolyLog[3, (-I
)*E^(I*ArcSin[c*x])] - 4*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(2*c^3*d)
```

Maple [F] time = 0.209, size = 0, normalized size = 0.

$$\int \frac{x^2\left(a+b\arcsin(cx)\right)^2}{-c^2dx^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}a^2\left(\frac{2x}{c^2d}-\frac{\log(cx+1)}{c^3d}+\frac{\log(cx-1)}{c^3d}\right)-\frac{2b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2c^3d\int\frac{2abc^2x^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx-\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(2*x/(c^2*d) - log(c*x + 1)/(c^3*d) + log(c*x - 1)/(c^3*d)) - 1/2*
(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - 2*c^3*d*integrate
(-(2*a*b*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (2*b^2*c*x*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - b^2*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d*x^2 - c^2*d), x) - b^
2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) + b^2*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1))/(c^3*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2x^2\arcsin(cx)^2+2\,abx^2\arcsin(cx)+a^2x^2}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^2*d*
x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a^2x^2}{c^2x^2-1}\,dx + \int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx^2\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**2/(c**2*x**2 - 1), x) + Integral(b**2*x**2*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**2*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx)+a)^2x^2}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d), x)
```

3.186 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=117

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^2d}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right)}{2c^2d}+\frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d}-\frac{\log\left(1+e^{2i\sin^{-1}(c\ldots\right.}{}$$

```
[Out] ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^2*d) - ((a + b*ArcSin[c*x])^2*Log[1 + E^
((2*I)*ArcSin[c*x])])/(c^2*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c^2*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^2
*d)
```

Rubi [A] time = 0.172138, antiderivative size = 117, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {4675, 3719, 2190, 2531, 2282, 6589}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^2d}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right)}{2c^2d}+\frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d}-\frac{\log\left(1+e^{2i\sin^{-1}(c\ldots\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^2*d) - ((a + b*ArcSin[c*x])^2*Log[1 + E^
((2*I)*ArcSin[c*x])])/(c^2*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c^2*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^2
*d)
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
```

```
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx=\frac{\text{Subst}\left(\int(a+bx)^2\tan(x)\,dx,x,\sin^{-1}(cx)\right)}{c^2d}$$
$$=\frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d}-\frac{(2i)\,\text{Subst}\left(\int\frac{e^{2ix}(a+bx)^2}{1+e^{2ix}}\,dx,x,\sin^{-1}(cx)\right)}{c^2d}$$
$$=\frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d}-\frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d}+\frac{(2b)\,\text{Subst}\left(\int(a+bx)\log\left(1\right.\right.}{c^2d}$$
$$=\frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d}-\frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d}+\frac{ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-e^{2i}\right.}{c^2d}$$
$$=\frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d}-\frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d}+\frac{ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-e^{2i}\right.}{c^2d}$$
$$=\frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d}-\frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d}+\frac{ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-e^{2i}\right.}{c^2d}$$

Mathematica [A] time = 0.0801326, size = 143, normalized size = 1.22

$$\frac{6ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-3b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right)-3a^2\log\left(1-c^2x^2\right)+6iab\sin^{-1}(cx)^2-12}{6c^2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] ((6*I)*a*b*ArcSin[c*x]^2 + (2*I)*b^2*ArcSin[c*x]^3 - 12*a*b*ArcSin[c*x]*Log
[1 + E^((2*I)*ArcSin[c*x])] - 6*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c
*x])] - 3*a^2*Log[1 - c^2*x^2] + (6*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^
((2*I)*ArcSin[c*x])] - 3*b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(6*c^2*d)
```

Maple [A] time = 0.063, size = 258, normalized size = 2.2

$$-\frac{a^2\ln(cx-1)}{2c^2d}-\frac{a^2\ln(cx+1)}{2c^2d}+\frac{\frac{i}{3}b^2(\arcsin(cx))^3}{c^2d}-\frac{b^2(\arcsin(cx))^2}{c^2d}\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)+\frac{ib^2\arcsin(cx)}{c^2d}\text{po}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2/c^2*a^2/d*ln(c*x-1)-1/2/c^2*a^2/d*ln(c*x+1)+1/3*I/c^2*b^2/d*arcsin(c*x
)^3-1/c^2*b^2/d*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I/c^2*b^2/
d*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2*polylog(3,-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^2/d+I/c^2*a*b/d*arcsin(c*x)^2-2/c^2*a*b/d*ar
csin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I/c^2*a*b/d*polylog(2,-(I*c*x+
(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{b^2 x \arcsin(cx)^2 + 2\,abx \arcsin(cx) + a^2 x}{c^2 d x^2 - d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x)/(c^2*d*x^2 -
d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a^2 x}{c^2 x^2 - 1}\,dx + \int \frac{b^2 x \operatorname{asin}^2(cx)}{c^2 x^2 - 1}\,dx + \int \frac{2abx \operatorname{asin}(cx)}{c^2 x^2 - 1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x/(c**2*x**2 - 1), x) + Integral(b**2*x*asin(c*x)**2/(c**2*
x**2 - 1), x) + Integral(2*a*b*x*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)^2 x}{c^2 d x^2 - d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x/(c^2*d*x^2 - d), x)
```

3.187 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=156

$$\frac{2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd}-\frac{2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd}-\frac{2b^2\text{PolyLog}\left(3,-ie^{i\,\mathrm{s}}\right.}{cd}$$

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + ((2*I)*b*(
a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - ((2*I)*b*(a
+ b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d) - (2*b^2*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(c*d) + (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(
c*d)
```

Rubi [A] time = 0.127072, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4657, 4181, 2531, 2282, 6589}

$$\frac{2ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd}-\frac{2ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd}-\frac{2b^2\text{PolyLog}\left(3,-ie^{i\,\mathrm{s}}\right.}{cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2),x]
```

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + ((2*I)*b*(
a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - ((2*I)*b*(a
+ b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d) - (2*b^2*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(c*d) + (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(
c*d)
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx = \frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{cd}$$
$$= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} - \frac{(2b)\,\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)dx, x, \sin^{-1}(cx)\right.}{cd}$$
$$= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} + \frac{2ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd} - \frac{2ib\left(a+b\right.}{}$$
$$= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} + \frac{2ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd} - \frac{2ib\left(a+b\right.}{}$$
$$= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} + \frac{2ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd} - \frac{2ib\left(a+b\right.}{}$$

Mathematica [A] time = 0.509011, size = 207, normalized size = 1.33

$$\frac{4ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-4ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-4b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(c\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2),x]
```

```
[Out] ((-4*I)*b^2*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] + 4*a*b*ArcSin[c*x]*Log
[1 - I*E^(I*ArcSin[c*x])] - 4*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])]
- a^2*Log[1 - c*x] + a^2*Log[1 + c*x] + (4*I)*b*(a + b*ArcSin[c*x])*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I
*ArcSin[c*x])] - 4*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 4*b^2*PolyLog[3
, I*E^(I*ArcSin[c*x])])/(2*c*d)
```

Maple [B] time = 0.106, size = 404, normalized size = 2.6

$$-\frac{b^2(\arcsin(cx))^2}{dc}\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)+\frac{2\,ib^2\arcsin(cx)}{dc}\text{polylog}\left(2,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-2\,\frac{b^2\text{polylog}\left(3,\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] -1/c/d*b^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I/c/d*b^2*arc
sin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*b^2*polylog(3,-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/d/c+1/c/d*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2)))-2*I/c/d*b^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2
*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d/c-2/c*a*b/d*arcsin(c*x)*ln(1
+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I/c/d*a*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)
^(1/2)))+2/c*a*b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/c/d*a
*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/c/d*a^2*arctan(I*c*x+(-c^2*x
^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^2\left(\frac{\log(cx+1)}{cd}-\frac{\log(cx-1)}{cd}\right)+\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2\log(cx+1)-b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(log(c*x + 1)/(c*d) - log(c*x - 1)/(c*d)) + 1/2*(b^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2*log(-c*x + 1) + 2*c*d*integrate(-(2*a*b*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) - (b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))*log(c*x + 1) - b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x +
 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^2 - d), x))/(c*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a^2}{c^2x^2-1}\,dx+\int\frac{b^2\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx+\int\frac{2ab\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**2 - 1), x) + Integral(b**2*asin(c*x)**2/(c**2*x**2
 - 1), x) + Integral(2*a*b*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin{(cx)} + a)^2}{c^2dx^2 - d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d), x)
```

3.188 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)}\,dx$

Optimal. Leaf size=131

$$\frac{ib\mathrm{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{ib\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{b^2\mathrm{PolyLog}\left(3,-e^{2i\sin^{-1}\cdots}\right.}{2d}$$

```
[Out] (-2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + (I*b*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d - (I*b*(a + b*ArcSin[c*x]
)*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c
*x])])/(2*d) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rubi [A] time = 0.196594, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4679, 4419, 4183, 2531, 2282, 6589}

$$\frac{ib\mathrm{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{ib\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{b^2\mathrm{PolyLog}\left(3,-e^{2i\sin^{-1}\cdots}\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (-2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + (I*b*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d - (I*b*(a + b*ArcSin[c*x]
)*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c
*x])])/(2*d) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
```

```
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)}\,dx &= \frac{\text{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\
&= \frac{2\,\text{Subst}\left(\int (a+bx)^2\csc(2x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\
&= -\frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{(2b)\,\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx,x,\sin^{-1}(c\right.}{d}\\
&= -\frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{ib\left(a+b\right.}{}\\
&= -\frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{ib\left(a+b\right.}{}\\
&= -\frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{ib\left(a+b\right.}{}
\end{aligned}$$

Mathematica [A] time = 0.194788, size = 254, normalized size = 1.94

$$\frac{24ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)-24iab\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+24ib^2\sin^{-1}(cx)\text{PolyLog}\left(2,e^{-2i\sin^{-1}(cx)}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)),x]
```

```
[Out] ((-I)*b^2*Pi^3 + (16*I)*b^2*ArcSin[c*x]^3 + 24*b^2*ArcSin[c*x]^2*Log[1 - E^
((-2*I)*ArcSin[c*x])] + 48*a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
 48*a*b*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - 24*b^2*ArcSin[c*x]^2*L
og[1 + E^((2*I)*ArcSin[c*x])] + 24*a^2*Log[c*x] - 12*a^2*Log[1 - c^2*x^2] +
 (24*I)*b^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (24*I)*b*(a +
b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (24*I)*a*b*PolyLog[2, E
^((2*I)*ArcSin[c*x])] + 12*b^2*PolyLog[3, E^((-2*I)*ArcSin[c*x])] - 12*b^2*
PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(24*d)
```

Maple [B] time = 0.092, size = 529, normalized size = 4.

$$-\frac{a^2\ln(cx-1)}{2d}-\frac{a^2\ln(cx+1)}{2d}+\frac{a^2\ln(cx)}{d}+\frac{b^2(\arcsin(cx))^2}{d}\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-\frac{2ib^2\arcsin(cx)}{d}\text{polylog}($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2*a^2/d*ln(c*x-1)-1/2*a^2/d*ln(c*x+1)+a^2/d*ln(c*x)+b^2/d*arcsin(c*x)^2*
ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b^2/d*arcsin(c*x)*polylog(2,-I*c*x-(-c^2
*x^2+1)^(1/2))+2*b^2/d*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+b^2/d*arcsin(c*
x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2/d*arcsin(c*x)*polylog(2,I*c*x+(
-c^2*x^2+1)^(1/2))+2*b^2/d*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-b^2/d*arcsin
(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*I*a*b/d*polylog(2,I*c*x+(-c^2*
x^2+1)^(1/2))-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+2*a*b/d*ar
csin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*b^2/d*arcsin(c*x)*polylog(2,-(I*
c*x+(-c^2*x^2+1)^(1/2))^2)+2*a*b/d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))+I*a*b/d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*a*b/d*arcsin(c*x)*ln(
1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*I*a*b/d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/
2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}a^2\left(\frac{\log(cx+1)}{d}+\frac{\log(cx-1)}{d}-\frac{2\log(x)}{d}\right)-\int\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2ab\arctan\left(cx,\sqrt{cx+1}\sqrt{-c}\right.}{c^2dx^3-dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(log(c*x + 1)/d + log(c*x - 1)/d - 2*log(x)/d) - integrate((b^2*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))/(c^2*d*x^3 - d*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2}{c^2dx^3-dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^3 - d*x),
x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a^2}{c^2x^3-x}\,dx+\int\frac{b^2\operatorname{asin}^2(cx)}{c^2x^3-x}\,dx+\int\frac{2ab\operatorname{asin}(cx)}{c^2x^3-x}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**3 - x), x) + Integral(b**2*asin(c*x)**2/(c**2*x**3
 - x), x) + Integral(2*a*b*asin(c*x)/(c**2*x**3 - x), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)^2}{(c^2dx^2 - d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x), x)
```

3.189 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)}\,dx$

Optimal. Leaf size=238

$$\frac{2ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{2ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}+\frac{2ib^2c\text{PolyLog}\left(2,-\right.}{d}$$

```
[Out] -((a + b*ArcSin[c*x])^2/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/d - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/
d + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c*(a + b*ArcS
in[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c*(a + b*ArcSin[c
*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcS
in[c*x])])/d - (2*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c*Po
lyLog[3, I*E^(I*ArcSin[c*x])])/d
```

Rubi [A] time = 0.347538, antiderivative size = 238, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.37, Rules used = {4701, 4657, 4181, 2531, 2282, 6589, 4709, 4183, 2279, 2391}

$$\frac{2ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{2ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}+\frac{2ib^2c\text{PolyLog}\left(2,-\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)),x]
```


```
[Out] -((a + b*ArcSin[c*x])^2/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/d - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/
d + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c*(a + b*ArcS
in[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c*(a + b*ArcSin[c
*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcS
in[c*x])])/d - (2*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c*Po
lyLog[3, I*E^(I*ArcSin[c*x])])/d
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
```

```
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)}dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx}+c^2\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}dx+\frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}dx}{d}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx}+\frac{c\,\mathrm{Subst}\left(\int (a+bx)^2\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{d}+\frac{(2bc)\,\mathrm{Subst}\left(\int (a+b\right.}{}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx}-\frac{2ic\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc\left(a+b\sin^{-1}(cx)\right)\tanh}{d}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx}-\frac{2ic\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc\left(a+b\sin^{-1}(cx)\right)\tanh}{d}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx}-\frac{2ic\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc\left(a+b\sin^{-1}(cx)\right)\tanh}{d}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx}-\frac{2ic\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc\left(a+b\sin^{-1}(cx)\right)\tanh}{d}$$

Mathematica [A] time = 0.714095, size = 391, normalized size = 1.64

$$-\frac{4abc\left(-i\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+i\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{\sin^{-1}(cx)}{cx}+\sin^{-1}(cx)\left(-\log\left(1-ie^{i\sin^{-1}(cx)}\right)\right)+\sin^{-1}(\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -((2*a^2)/x + a^2*c*Log[1 - c*x] - a^2*c*Log[1 + c*x] + 4*a*b*c*(ArcSin[c*x
]/(c*x) - ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + I*
E^(I*ArcSin[c*x])] + Log[Cos[ArcSin[c*x]/2]] - Log[Sin[ArcSin[c*x]/2]] - I*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + I*PolyLog[2, I*E^(I*ArcSin[c*x])]) + 2
*b^2*c*(ArcSin[c*x]^2/(c*x) - 2*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Ar
cSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + I*E^(I*Arc
Sin[c*x])] + 2*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (2*I)*PolyLog[2, -E
^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
(2*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + (2*I)*PolyLog[2, E^(I*A
rcSin[c*x])] + 2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 2*PolyLog[3, I*E^(I*A
rcSin[c*x])]))/(2*d)
```

Maple [A] time = 0.21, size = 575, normalized size = 2.4

$$-\frac{ca^2\ln(cx-1)}{2d}+\frac{ca^2\ln(cx+1)}{2d}-\frac{a^2}{dx}-\frac{b^2(\arcsin(cx))^2}{dx}-\frac{2\,icab}{d}\mathrm{dilog}\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-2\frac{cb^2\arcsin(cx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x)
```

```
[Out] -1/2*c*a^2/d*ln(c*x-1)+1/2*c*a^2/d*ln(c*x+1)-a^2/d/x-b^2/d/x*arcsin(c*x)^2-
2*I*c*a*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*c*b^2/d*arcsin(c*x)*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*c*b^2/d*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-c/d
*b^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*c/d*b^2*arcsin(c*
x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*b^2*c*polylog(3,-I*(I*c*x+(-c^
```

```
2*x^2+1)^(1/2)))/d+c/d*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
+2*I*c*b^2/d*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2*c*polylog(3,I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/d-2*a*b/d*arcsin(c*x)/x+2*c*a*b/d*arcsin(c*x)*ln(1-I*(I
*c*x+(-c^2*x^2+1)^(1/2)))-2*c*a*b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^
(1/2)))+2*c*a*b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-2*c*a*b/d*ln(1+I*c*x+(-c^2
*x^2+1)^(1/2))+2*I*c*a*b/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*c/d*b^
2*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^2\left(\frac{c\log(cx+1)}{d}-\frac{c\log(cx-1)}{d}-\frac{2}{dx}\right)+\frac{b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2\log(cx+1)-b^2cx\arctan\left(cx,\sqrt{cx+1}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(c*log(c*x + 1)/d - c*log(c*x - 1)/d - 2/(d*x)) + 1/2*(b^2*c*x*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - b^2*c*x*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*b^2*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1))^2 + 2*d*x*integrate(-(2*a*b*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) - (b^2*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))*log(c*x + 1) - b^2*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*lo
g(-c*x + 1) - 2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*
x + 1)*sqrt(-c*x + 1))/(c^2*d*x^4 - d*x^2), x))/(d*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2}{c^2dx^4-dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^4 - d*x^2)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a^2}{c^2x^4-x^2}\,dx+\int\frac{b^2\operatorname{asin}^2(cx)}{c^2x^4-x^2}\,dx+\int\frac{2ab\operatorname{asin}(cx)}{c^2x^4-x^2}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**4 - x**2), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**4 - x**2), x) + Integral(2*a*b*asin(c*x)/(c**2*x**4 - x**2), x))/d
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] Timed out
```

3.190 $\int \frac{\left(a+b \sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)} dx$

Optimal. Leaf size=210

$$\frac{ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{b^2c^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right.}{2d}$$

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x)) - (a + b*ArcSin[c*x])^
2/(2*d*x^2) - (2*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/
d + (b^2*c^2*Log[x])/d + (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*
ArcSin[c*x])])/d - (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[
c*x])])/d - (b^2*c^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d) + (b^2*c^2*P
olyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rubi [A] time = 0.382664, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4701, 4679, 4419, 4183, 2531, 2282, 6589, 4681, 29}

$$\frac{ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{b^2c^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x)) - (a + b*ArcSin[c*x])^
2/(2*d*x^2) - (2*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/
d + (b^2*c^2*Log[x])/d + (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*
ArcSin[c*x])])/d - (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[
c*x])])/d - (b^2*c^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d) + (b^2*c^2*P
olyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
```

```
x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2} + c^2\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)}\,dx + \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{x^2\sqrt{1-c^2x^2}}\,dx}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2} + \frac{c^2\,\mathrm{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx,\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2} + \frac{b^2c^2\log(x)}{d} + \frac{\left(2c^2\right)\mathrm{Subst}\left(\int (a+bx)^2\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(\right.}{d}$$

Mathematica [A] time = 1.19558, size = 353, normalized size = 1.68

$$-\frac{2abc^2\left(-i\mathrm{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+i\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{\sqrt{1-c^2x^2}}{cx}+\frac{\sin^{-1}(cx)}{c^2x^2}-2\sin^{-1}(cx)\log\left(1-e^{2i\sin^{-1}(cx)}\right)+\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -(a^2/x^2 - 2*a^2*c^2*Log[x] + a^2*c^2*Log[1 - c^2*x^2] + 2*a*b*c^2*(Sqrt[1
 - c^2*x^2]/(c*x) + ArcSin[c*x]/(c^2*x^2) - 2*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - I*PolyLog[2,
 -E^((2*I)*ArcSin[c*x])] + I*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 2*b^2*c^2
*((I/24)*Pi^3 + (Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]^2/(2*c^
2*x^2) - ((2*I)/3)*ArcSin[c*x]^3 - ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c
*x])] + ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - Log[c*x] - I*ArcSin[
c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - I*ArcSin[c*x]*PolyLog[2, -E^((2*I
)*ArcSin[c*x])] - PolyLog[3, E^((-2*I)*ArcSin[c*x])]/2 + PolyLog[3, -E^((2*
I)*ArcSin[c*x])]/2))/(2*d)
```

Maple [B] time = 0.262, size = 793, normalized size = 3.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x)
```

```
[Out] 2*c^2*a*b/d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*c^2*b^2/d*arcsin(c
*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-c*a*b/d/x*(-c^2*x^2+1)^(1/2)+2
*c^2*a*b/d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-c*b^2/d*arcsin(c*x)/x
*(-c^2*x^2+1)^(1/2)-2*I*c^2*b^2/d*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)
^(1/2))-2*I*c^2*b^2/d*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*I*c
```

```
^2*a*b/d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*c^2*a*b/d*polylog(2,I*c*x
+(-c^2*x^2+1)^(1/2))-2*c^2*a*b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)+I*c^2*a*b/d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+c^2*a^2/d*ln(c*x)
+2*c^2*b^2/d*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+2*c^2*b^2/d*polylog(3,I*c
*x+(-c^2*x^2+1)^(1/2))-1/2*c^2*a^2/d*ln(c*x+1)+c^2*b^2/d*ln(I*c*x+(-c^2*x^2
+1)^(1/2)-1)+c^2*b^2/d*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*c^2*b^2/d*ln(I*c*x+
(-c^2*x^2+1)^(1/2))-1/2*c^2*a^2/d*ln(c*x-1)-1/2*b^2/d*arcsin(c*x)^2/x^2-1/2
*a^2/d/x^2+c^2*b^2/d*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+c^2*b^2/d
*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-c^2*b^2/d*arcsin(c*x)^2*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*c^2*b^2/d*arcsin(c*x)-1/2*b^2*c^2*polylog(3
,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+I*c^2*a*b/d-a*b/d*arcsin(c*x)/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\left(\frac{c^2\log(cx+1)}{d}+\frac{c^2\log(cx-1)}{d}-\frac{2c^2\log(x)}{d}+\frac{1}{dx^2}\right)a^2-\int\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2ab\arctan\left(c\right.}{c^2dx^5-dx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*(c^2*log(c*x + 1)/d + c^2*log(c*x - 1)/d - 2*c^2*log(x)/d + 1/(d*x^2))
*a^2 - integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^2*d*x^5 - d*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2}{c^2dx^5-dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^5 - d*x^3)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a^2}{c^2x^5-x^3}\,dx+\int\frac{b^2\operatorname{asin}^2(cx)}{c^2x^5-x^3}\,dx+\int\frac{2ab\operatorname{asin}(cx)}{c^2x^5-x^3}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**5 - x**3), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**5 - x**3), x) + Integral(2*a*b*asin(c*x)/(c**2*x**5 - x**3), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^3), x)
```

3.191 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)}\,dx$

Optimal. Leaf size=333

$$\frac{2ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{2ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}+\frac{7ib^2c^3\text{PolyLog}\left(\right.}{3d}$$

```
[Out] -(b^2*c^2)/(3*d*x) - (b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*d*x^2)
- (a + b*ArcSin[c*x])^2/(3*d*x^3) - (c^2*(a + b*ArcSin[c*x])^2)/(d*x) - ((2
*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d - (14*b*c^3*(a +
 b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d) + (((7*I)/3)*b^2*c^3*Poly
Log[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I
*E^(I*ArcSin[c*x])])/d - (((7*I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/
d - (2*b^2*c^3*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c^3*PolyLog[3
, I*E^(I*ArcSin[c*x])])/d
```

Rubi [A] time = 0.654227, antiderivative size = 333, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4701, 4657, 4181, 2531, 2282, 6589, 4709, 4183, 2279, 2391, 30}

$$\frac{2ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}-\frac{2ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d}+\frac{7ib^2c^3\text{PolyLog}\left(\right.}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)),x]
```


```
[Out] -(b^2*c^2)/(3*d*x) - (b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*d*x^2)
- (a + b*ArcSin[c*x])^2/(3*d*x^3) - (c^2*(a + b*ArcSin[c*x])^2)/(d*x) - ((2
*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d - (14*b*c^3*(a +
 b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d) + (((7*I)/3)*b^2*c^3*Poly
Log[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I
*E^(I*ArcSin[c*x])])/d - (((7*I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/
d - (2*b^2*c^3*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c^3*PolyLog[3
, I*E^(I*ArcSin[c*x])])/d
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} + c^2\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x^3\sqrt{1-c^2x^2}}\,dx}{3d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{dx} + c^4\int \frac{(a+b \cdots}{d \cdots}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{dx} + \frac{c^3\,\mathrm{Su}\cdots}{\cdots}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{dx} - \frac{2ic^3\cdots}{\cdots}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{dx} - \frac{2ic^3\cdots}{\cdots}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{dx} - \frac{2ic^3\cdots}{\cdots}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} - \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{dx} - \frac{2ic^3\cdots}{\cdots}$$

Mathematica [B] time = 7.8188, size = 849, normalized size = 2.55

$$-\frac{a^2\log(1-cx)c^3}{2d} + \frac{a^2\log(cx+1)c^3}{2d} - \frac{b^2\left(\frac{1}{2}cx\sin^{-1}(cx)^2\csc^4\left(\frac{1}{2}\sin^{-1}(cx)\right) + 2\sin^{-1}(cx)\csc^2\left(\frac{1}{2}\sin^{-1}(cx)\right) + \frac{8\sin^{-1}(\cdots}{\cdots}\cdots\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -a^2/(3*d*x^3) - (a^2*c^2)/(d*x) - (a^2*c^3*Log[1 - c*x])/(2*d) + (a^2*c^3*
Log[1 + c*x])/(2*d) - (2*a*b*(-(c^2*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1 -
c^2*x^2]])) + (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sqrt
[1 - c^2*x^2]])/(6*x^3) + (c^4*((((3*I)/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSi
n[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi*Log[1 + I*E^(I*A
rcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c - (2*Pi*Lo
g[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I
)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c))/2 - (c^4*(((I/2)*Pi*ArcSin[c*x])/
c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c + (Pi*
Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x]
)])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(Pi + 2*ArcSin[c*x])
/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/2))/d - (b^2*c^3*(4*C
ot[ArcSin[c*x]/2] + 14*ArcSin[c*x]^2*Cot[ArcSin[c*x]/2] + 2*ArcSin[c*x]*Csc
[ArcSin[c*x]/2]^2 + (c*x*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^4)/2 - 56*ArcSin[
c*x]*Log[1 - E^(I*ArcSin[c*x])] - 24*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*
x])] + 24*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 56*ArcSin[c*x]*Log[1
 + E^(I*ArcSin[c*x])] - (56*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (48*I)*ArcS
in[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (48*I)*ArcSin[c*x]*PolyLog[2,
I*E^(I*ArcSin[c*x])] + (56*I)*PolyLog[2, E^(I*ArcSin[c*x])] + 48*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])] - 48*PolyLog[3, I*E^(I*ArcSin[c*x])] - 2*ArcSin[c*
x]*Sec[ArcSin[c*x]/2]^2 + (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3)
+ 4*Tan[ArcSin[c*x]/2] + 14*ArcSin[c*x]^2*Tan[ArcSin[c*x]/2]))/(24*d)
```

Maple [A] time = 0.312, size = 725, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x)
```

```
[Out] -1/3*b^2*c^2/d/x-1/3*a^2/d/x^3-c^2*a^2/d/x-1/2*c^3*a^2/d*ln(c*x-1)+1/2*c^3*
a^2/d*ln(c*x+1)-1/3*b^2/d/x^3*arcsin(c*x)^2+7/3*c^3*a*b/d*ln(I*c*x+(-c^2*x^
2+1)^(1/2)-1)-2*b^2*c^3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d+2*b^2*c^
3*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-7/3*c^3*a*b/d*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2))-7/3*c^3*b^2/d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-c^3/
d*b^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+c^3/d*b^2*arcsin(c*x
)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-c^2*b^2/d/x*arcsin(c*x)^2-2/3*a*b/d*
arcsin(c*x)/x^3+7/3*I*c^3*b^2/d*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+7/3*I*c^3*b
^2/d*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/3*c*a*b/d/x^2*(-c^2*x^2+1)^(1/2)-2
*c^3*a*b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*c^3*a*b/d*arcsi
n(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*c^2*a*b/d*arcsin(c*x)/x-1/3*c*b
^2/d/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2*I*c^3*a*b/d*dilog(1+I*(I*c*x+(-c^
2*x^2+1)^(1/2)))-2*I*c^3*a*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*c^
3/d*b^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*c^3/d*b^2*a
rcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{6}\left(\frac{3\,c^3\log(cx+1)}{d} - \frac{3\,c^3\log(cx-1)}{d} - \frac{2\left(3\,c^2x^2+1\right)}{dx^3}\right)a^2 + \frac{3\,b^2c^3x^3\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)^2\log(cx+1) - 3\,b^2c^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/6*(3*c^3*log(c*x + 1)/d - 3*c^3*log(c*x - 1)/d - 2*(3*c^2*x^2 + 1)/(d*x^3
))*a^2 + 1/6*(3*b^2*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*lo
g(c*x + 1) - 3*b^2*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log
(-c*x + 1) + 6*d*x^3*integrate(-1/3*(6*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)) - (3*b^2*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(
c*x + 1) - 3*b^2*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*
x + 1) - 2*(3*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^6 - d*x^4), x) - 2*(3*b^2*c^2*
x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/(d*x^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2\arcsin(cx)^2 + 2\,ab\arcsin(cx) + a^2}{c^2dx^6 - dx^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^6 - d*x^4)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a^2}{c^2x^6-x^4}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^2x^6-x^4}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^2x^6-x^4}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**6 - x**4), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**6 - x**4), x) + Integral(2*a*b*asin(c*x)/(c**2*x**6 - x**4), x))/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^4), x)
```

3.192 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=300

$$-\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d^2}+\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d^2}+\frac{3b^2\text{PolyLog}\left(3,-ie^{i\sin}\right.}{c^5d^2}$$

```
[Out] (-2*b^2*x)/(c^4*d^2) - (b*(a + b*ArcSin[c*x]))/(c^5*d^2*Sqrt[1 - c^2*x^2])
+ (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d^2) + (3*x*(a + b*ArcSi
n[c*x])^2)/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^
2)) + ((3*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^2) + (
b^2*ArcTanh[c*x])/(c^5*d^2) - ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])])/(c^5*d^2) + ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E
^(I*ArcSin[c*x])])/(c^5*d^2) + (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(
c^5*d^2) - (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```

Rubi [A] time = 0.525494, antiderivative size = 300, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 14, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.518, Rules used = {4703, 4715, 4657, 4181, 2531, 2282, 6589, 4677, 8, 266, 43, 4689, 388, 208}

$$-\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d^2}+\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^5d^2}+\frac{3b^2\text{PolyLog}\left(3,-ie^{i\sin}\right.}{c^5d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```


```
[Out] (-2*b^2*x)/(c^4*d^2) - (b*(a + b*ArcSin[c*x]))/(c^5*d^2*Sqrt[1 - c^2*x^2])
+ (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d^2) + (3*x*(a + b*ArcSi
n[c*x])^2)/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^
2)) + ((3*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^2) + (
b^2*ArcTanh[c*x])/(c^5*d^2) - ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])])/(c^5*d^2) + ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E
^(I*ArcSin[c*x])])/(c^5*d^2) + (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(
c^5*d^2) - (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
```

```
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{cd^2} - \frac{3\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{c^5d^2\sqrt{1-c^2x^2}} - \frac{b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^3\left(a+b\sin\right.}{2c^2d^2\left(1-\right.}$$

$$= \frac{b^2x}{c^4d^2} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^3\left(a\right.}{2c^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^3}{2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^3}{2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^3}{2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^3}{2}$$

Mathematica [B] time = 3.10413, size = 614, normalized size = 2.05

$$-12ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+12ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)+12b^2\text{PolyLog}\left(3,-\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] (4*a^2*c*x + (8*b^2*c^3*x^3)/(1 - c^2*x^2) + 8*a*b*Sqrt[1 - c^2*x^2] + (2*a
*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*a*b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2
*a^2*c*x)/(-1 + c^2*x^2) + (8*b^2*c*x)/(-1 + c^2*x^2) + (6*I)*a*b*Pi*ArcSin
[c*x] + 8*a*b*c*x*ArcSin[c*x] - (2*a*b*ArcSin[c*x])/(-1 + c*x) - (2*a*b*Arc
Sin[c*x])/(1 + c*x) + (2*b^2*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (6*b^2*c^2*x^
2*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + (6
*b^2*c*x*ArcSin[c*x]^2)/(1 - c^2*x^2) + (4*b^2*c^3*x^3*ArcSin[c*x]^2)/(-1 +
 c^2*x^2) + (12*I)*b^2*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] + 4*b^2*ArcT
anh[c*x] - 6*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 12*a*b*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] - 6*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 12*a*b*Ar
cSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a^2*Log[1 - c*x] - 3*a^2*Log[1 +
 c*x] + 6*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 6*a*b*Pi*Log[Sin[(Pi +
 2*ArcSin[c*x])/4]] - (12*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])] + (12*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] +
 12*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 12*b^2*PolyLog[3, I*E^(I*ArcSi
n[c*x])])/(4*c^5*d^2)
```

Maple [B] time = 0.409, size = 705, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] 2/c^5*a*b/d^2*(-c^2*x^2+1)^(1/2)+2/c^5*b^2/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/
2)+3/2/c^5*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2/c^5
*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/c^5*b^2/d^2*a
rctan(I*c*x+(-c^2*x^2+1)^(1/2))+1/c^4*b^2/d^2*arcsin(c*x)^2*x-2*b^2*x/c^4/d
^2-1/c^4*a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*x-1/4/c^5*a^2/d^2/(c*x-1)+3/4/c^5*
a^2/d^2*ln(c*x-1)-3/4/c^5*a^2/d^2*ln(c*x+1)-1/4/c^5*a^2/d^2/(c*x+1)+1/c^4*a
^2/d^2*x+3*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2-3*b^2*polyl
og(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2+1/c^5*a*b/d^2/(c^2*x^2-1)*(-c^2*
x^2+1)^(1/2)+2/c^4*a*b/d^2*arcsin(c*x)*x-1/2/c^4*b^2/d^2/(c^2*x^2-1)*arcsin
(c*x)^2*x-3*I/c^5*b^2/d^2*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+3*I/c^5*b^2/d^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*I
/c^5*a*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*I/c^5*a*b/d^2*dilog(1-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/c^5*a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2
*x^2+1)^(1/2)))-3/c^5*a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)+1/c^5*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a^2\left(\frac{2x}{c^6d^2x^2-c^4d^2}-\frac{4x}{c^4d^2}+\frac{3\log(cx+1)}{c^5d^2}-\frac{3\log(cx-1)}{c^5d^2}\right)-\frac{3\left(b^2c^2x^2-b^2\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2\log\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*x/(c^6*d^2*x^2 - c^4*d^2) - 4*x/(c^4*d^2) + 3*log(c*x + 1)/(c^5
*d^2) - 3*log(c*x - 1)/(c^5*d^2)) - 1/4*(3*(b^2*c^2*x^2 - b^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*(b^2*c^2*x^2 - b^2)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(2*b^2*c^3*x^3 -
3*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^7*d^2*x^2 -
c^5*d^2)*integrate(-1/2*(4*a*b*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) - (3*(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*
log(c*x + 1) - 3*(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))*log(-c*x + 1) - 2*(2*b^2*c^3*x^3 - 3*b^2*c*x)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^8*d^2*x^4 - 2*c^6*d^2*
x^2 + c^4*d^2), x))/(c^7*d^2*x^2 - c^5*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2x^4 \arcsin(cx)^2 + 2\,abx^4 \arcsin(cx) + a^2x^4}{c^4d^2x^4 - 2\,c^2d^2x^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{a^2x^4}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^4\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^4\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**4/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**4*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**4*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2x^4}{(c^2dx^2 - d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d)^2, x)
```

3.193 $\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=227

$$-\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d^2}+\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d^2}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)}-\frac{bx\left(a+b\sin\right.}{c^3d^2\sqrt{1-c}}$$

```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*
x])^2/(2*c^4*d^2) + (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) -
 ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])^2*Log[1 +
 E^((2*I)*ArcSin[c*x])])/(c^4*d^2) - (b^2*Log[1 - c^2*x^2])/(2*c^4*d^2) - (
I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2) + (b^
2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^4*d^2)
```

Rubi [A] time = 0.394962, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4703, 4675, 3719, 2190, 2531, 2282, 6589, 4641, 260}

$$-\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^4d^2}+\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}(cx)}\right)}{2c^4d^2}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)}-\frac{bx\left(a+b\sin\right.}{c^3d^2\sqrt{1-c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```


```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*
x])^2/(2*c^4*d^2) + (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) -
 ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])^2*Log[1 +
 E^((2*I)*ArcSin[c*x])])/(c^4*d^2) - (b^2*Log[1 - c^2*x^2])/(2*c^4*d^2) - (
I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2) + (b^
2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^4*d^2)
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
```

```
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{cd^2} - \frac{\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx}{c^2d}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{\text{Subst}\left(\int(a+bx)^2\tan(x)\,dx, x, \sin^{-1}(c\right.}{c^4d^2}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^4d^2}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^4d^2}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^4d^2}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^4d^2}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^4d^2}$$

Mathematica [B] time = 1.05886, size = 502, normalized size = 2.21

$$-12iab\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) - 12iab\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) - 6ib^2\sin^{-1}(cx)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right) + 3b^2\text{PolyL}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (3*a*b*Sqrt[1 - c^2*x^2])/(1 + c*x)
 - (3*a^2)/(-1 + c^2*x^2) + (12*I)*a*b*Pi*ArcSin[c*x] - (3*a*b*ArcSin[c*x])
/(-1 + c*x) + (3*a*b*ArcSin[c*x])/(1 + c*x) - (6*b^2*c*x*ArcSin[c*x])/Sqrt[
1 - c^2*x^2] - (6*I)*a*b*ArcSin[c*x]^2 + (3*b^2*ArcSin[c*x]^2)/(1 - c^2*x^2
) - (2*I)*b^2*ArcSin[c*x]^3 + 24*a*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 6*a
*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcS
in[c*x])] - 6*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c*x]*Log[
1 + I*E^(I*ArcSin[c*x])] + 6*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x]
)] + 3*a^2*Log[1 - c^2*x^2] - 3*b^2*Log[1 - c^2*x^2] - 24*a*b*Pi*Log[Cos[Ar
cSin[c*x]/2]] + 6*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 6*a*b*Pi*Log[S
in[(Pi + 2*ArcSin[c*x])/4]] - (12*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]
 - (12*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - (6*I)*b^2*ArcSin[c*x]*PolyL
og[2, -E^((2*I)*ArcSin[c*x])] + 3*b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(
6*c^4*d^2)
```

Maple [B] time = 0.327, size = 585, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4/c^4*a^2/d^2/(c*x-1)+1/2/c^4*a^2/d^2*ln(c*x-1)+1/4/c^4*a^2/d^2/(c*x+1)+
1/2/c^4*a^2/d^2*ln(c*x+1)-I/c^4*a*b/d^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2
))^2)-I/c^2*a*b/d^2/(c^2*x^2-1)*x^2+1/c^3*b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*(
-c^2*x^2+1)^(1/2)*x-1/2/c^4*b^2/d^2*arcsin(c*x)^2/(c^2*x^2-1)-I/c^4*a*b/d^2
*arcsin(c*x)^2+1/c^4*b^2/d^2*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^
2)+I/c^4*b^2/d^2*arcsin(c*x)/(c^2*x^2-1)+1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^
2+1)^(1/2))^2)/c^4/d^2-1/c^4*b^2/d^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2/c
^4*b^2/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2))-1/3*I/c^4*b^2/d^2*arcsin(c*x)^3+I/c
^4*a*b/d^2/(c^2*x^2-1)+1/c^3*a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-1/c^4
*a*b/d^2*arcsin(c*x)/(c^2*x^2-1)-I/c^2*b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*x^2+
2/c^4*a*b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I/c^4*b^2/d^2*
arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2x^3\arcsin(cx)^2 + 2\,abx^3\arcsin(cx) + a^2x^3}{c^4d^2x^4 - 2\,c^2d^2x^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{a^2x^3}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^3\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**3/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**3*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**3*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2x^3}{\left(c^2dx^2-d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^3/(c^2*d*x^2 - d)^2, x)
```

3.194 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=233

$$-\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d^2}+\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d^2}+\frac{b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right.}{c^3d^2}$$

```
[Out] -((b*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c
*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) + (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*Ar
cSin[c*x])])/(c^3*d^2) + (b^2*ArcTanh[c*x])/(c^3*d^2) - (I*b*(a + b*ArcSin[
c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + (I*b*(a + b*ArcSin[c*
x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^2) + (b^2*PolyLog[3, (-I)*E^(I*
ArcSin[c*x])])/(c^3*d^2) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```

Rubi [A] time = 0.29931, antiderivative size = 233, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4703, 4657, 4181, 2531, 2282, 6589, 4677, 206}

$$-\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d^2}+\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{c^3d^2}+\frac{b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right.}{c^3d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```


```
[Out] -((b*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c
*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) + (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*Ar
cSin[c*x])])/(c^3*d^2) + (b^2*ArcTanh[c*x])/(c^3*d^2) - (I*b*(a + b*ArcSin[
c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + (I*b*(a + b*ArcSin[c*
x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^2) + (b^2*PolyLog[3, (-I)*E^(I*
ArcSin[c*x])])/(c^3*d^2) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
```

```
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}dx}{cd^2} - \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}dx}{2c^2d}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{2c^3d^2} +$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2} + \frac{b^2\,\text{ta}}{}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2} + \frac{b^2\,\text{ta}}{}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2} + \frac{b^2\,\text{ta}}{}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2} + \frac{b^2\,\text{ta}}{}$$

Mathematica [A] time = 2.63084, size = 383, normalized size = 1.64

$$-\frac{4iab\,\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) - 4iab\,\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) - 4b^2\left(-i\sin^{-1}(cx)\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) + i\sin^{-1}(cx)\text{P}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((2*a^2*c*x)/(-1 + c^2*x^2) + (2*b^2*ArcSin[c*x]*(-2*Sqrt[1 - c^2*x^2] + c
*x*ArcSin[c*x]))/(-1 + c^2*x^2) + (2*a*b*(1 - 2*Sqrt[1 - c^2*x^2] + Cos[2*A
rcSin[c*x]] + ArcSin[c*x]*(2*c*x - Log[1 - I*E^(I*ArcSin[c*x])] + Log[1 + I
*E^(I*ArcSin[c*x])] + Cos[2*ArcSin[c*x]]*(-Log[1 - I*E^(I*ArcSin[c*x])] + L
og[1 + I*E^(I*ArcSin[c*x])]))))/(-1 + c^2*x^2) - a^2*Log[1 - c*x] + a^2*Log
[1 + c*x] + (4*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*a*b*PolyLo
g[2, I*E^(I*ArcSin[c*x])] - 4*b^2*(I*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x])
] + ArcTanh[c*x] - I*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + I*Arc
Sin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + PolyLog[3, (-I)*E^(I*ArcSin[c*x]
)] - PolyLog[3, I*E^(I*ArcSin[c*x])]))/(4*c^3*d^2)
```

Maple [B] time = 0.267, size = 599, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4/c^3*a^2/d^2/(c*x-1)+1/4/c^3*a^2/d^2*ln(c*x-1)-1/4/c^3*a^2/d^2/(c*x+1)-
1/4/c^3*a^2/d^2*ln(c*x+1)-1/2/c^2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x+1/c^3
*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/2/c^3*b^2/d^2*arcsin(
c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I/c^3*a*b/d^2*dilog(1-I*(I*c*x+(-
```

```
c^2*x^2+1)^(1/2)))+b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^2-1/2
/c^3*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I/c^3*b^2/d^2
*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-b^2*polylog(3,I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/c^3/d^2-I/c^3*b^2/d^2*arcsin(c*x)*polylog(2,-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))-1/c^2*a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*x+1/c^3*a*b/d^2
/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+1/c^3*a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c
^2*x^2+1)^(1/2)))-1/c^3*a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))-2*I/c^3*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-I/c^3*a*b/d^2*dilog(1+
I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a^2\left(\frac{2x}{c^4d^2x^2-c^2d^2}+\frac{\log(cx+1)}{c^3d^2}-\frac{\log(cx-1)}{c^3d^2}\right)-\frac{2b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+\left(b^2c^2x^2-b^2\right)\arctan\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*x/(c^4*d^2*x^2 - c^2*d^2) + log(c*x + 1)/(c^3*d^2) - log(c*x -
1)/(c^3*d^2)) - 1/4*(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
 + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x
 + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*lo
g(-c*x + 1) + 4*(c^5*d^2*x^2 - c^3*d^2)*integrate(-1/2*(4*a*b*c^2*x^2*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (2*b^2*c*x*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))*log(c*x + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^2*x^4 - 2*c
^4*d^2*x^2 + c^2*d^2), x))/(c^5*d^2*x^2 - c^3*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2x^2\arcsin(cx)^2+2\,abx^2\arcsin(cx)+a^2x^2}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{a^2x^2}{c^4x^4-2c^2x^2+1}\,dx+\int\frac{b^2x^2\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx+\int\frac{2abx^2\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**2*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**2*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^2}{(c^2 dx^2 - d)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d)^2, x)
```

3.195 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=89

$$-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)}-\frac{b^2\log\left(1-c^2x^2\right)}{2c^2d^2}$$

```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*c^2*d^2*(1 - c^2*x^2)) - (b^2*Log[1 - c^2*x^2])/(2*c^2*d^2)
```

Rubi [A] time = 0.0985197, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12, Rules used = {4677, 4651, 260}

$$-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)}-\frac{b^2\log\left(1-c^2x^2\right)}{2c^2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*c^2*d^2*(1 - c^2*x^2)) - (b^2*Log[1 - c^2*x^2])/(2*c^2*d^2)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{cd^2}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} + \frac{b^2\int \frac{x}{1-c^2x^2}\,dx}{d^2}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b^2\log\left(1-c^2x^2\right)}{2c^2d^2}$$

Mathematica [A] time = 0.189782, size = 75, normalized size = 0.84

$$-\frac{\frac{2bcx\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2x^2-1} + b^2\log\left(1-c^2x^2\right)}{2c^2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((2*b*c*x*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2] + (a + b*ArcSin[c*x])^2/(
-1 + c^2*x^2) + b^2*Log[1 - c^2*x^2])/(2*c^2*d^2)
```

Maple [B] time = 0.03, size = 205, normalized size = 2.3

$$-\frac{a^2}{2c^2d^2\left(c^2x^2-1\right)} - \frac{b^2\left(\arcsin(cx)\right)^2}{2c^2d^2\left(c^2x^2-1\right)} + \frac{b^2\arcsin(cx)\,x}{cd^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1} - \frac{b^2\ln\left(-c^2x^2+1\right)}{2c^2d^2} - \frac{ab\arcsin(cx)}{c^2d^2\left(c^2x^2-1\right)} + \frac{ab}{2c^2d^2(cx-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/2/c^2*a^2/d^2/(c^2*x^2-1)-1/2/c^2*b^2/d^2*arcsin(c*x)^2/(c^2*x^2-1)+1/c*
b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-1/2*b^2*ln(-c^2*x^2+1)
/c^2/d^2-1/c^2*a*b/d^2/(c^2*x^2-1)*arcsin(c*x)+1/2/c^2*a*b/d^2/(c*x-1)*(-(c
*x-1)^2-2*c*x+2)^(1/2)+1/2/c^2*a*b/d^2/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)
```

Maxima [B] time = 1.67815, size = 495, normalized size = 5.56

$$\frac{1}{2}\left(\frac{\left(\frac{\sqrt{-c^2x^2+1}c^2d^2}{c^6d^4+\sqrt{c^6d^4}c^4d^2x} - \frac{\sqrt{-c^2x^2+1}c^2d^2}{c^6d^4-\sqrt{c^6d^4}c^4d^2x}\right)c^5d^2}{\sqrt{c^6d^4}} - \frac{2\arcsin(cx)}{c^4d^2x^2-c^2d^2}\right)ab - \frac{1}{2}\left(\frac{c^6d^2\left(\frac{\log(cx+1)}{c^5d^2} + \frac{\log(cx-1)}{c^5d^2}\right)}{\sqrt{c^6d^4}} - \frac{\left(\frac{\sqrt{-c^2x^2+1}c^2d^2}{c^6d^4+\sqrt{c^6d^4}c^4d^2x} - \frac{\sqrt{-c^2x^2+}}{c^6d^4-\sqrt{c^6}}\right.}{\sqrt{c^6}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*((sqrt(-c^2*x^2 + 1)*c^2*d^2/(c^6*d^4 + sqrt(c^6*d^4)*c^4*d^2*x) - sqrt
(-c^2*x^2 + 1)*c^2*d^2/(c^6*d^4 - sqrt(c^6*d^4)*c^4*d^2*x))*c^5*d^2/sqrt(c^
```

```
6*d^4) - 2*arcsin(c*x)/(c^4*d^2*x^2 - c^2*d^2))*a*b - 1/2*(c^6*d^2*(log(c*x
 + 1)/(c^5*d^2) + log(c*x - 1)/(c^5*d^2))/sqrt(c^6*d^4) - (sqrt(-c^2*x^2 +
1)*c^2*d^2/(c^6*d^4 + sqrt(c^6*d^4)*c^4*d^2*x) - sqrt(-c^2*x^2 + 1)*c^2*d^2
/(c^6*d^4 - sqrt(c^6*d^4)*c^4*d^2*x))*c^5*d^2*arcsin(c*x)/sqrt(c^6*d^4))*b^
2 - 1/2*b^2*arcsin(c*x)^2/(c^4*d^2*x^2 - c^2*d^2) - 1/2*a^2/(c^4*d^2*x^2 -
c^2*d^2)
```

Fricas [A] time = 2.65029, size = 230, normalized size = 2.58

$$-\frac{b^2 \arcsin(cx)^2 + 2\,ab \arcsin(cx) + a^2 + \left(b^2c^2x^2 - b^2\right)\log\left(c^2x^2 - 1\right) - 2\left(b^2cx \arcsin(cx) + abcx\right)\sqrt{-c^2x^2 + 1}}{2\left(c^4d^2x^2 - c^2d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2 + (b^2*c^2*x^2 - b^2)*log
(c^2*x^2 - 1) - 2*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt(-c^2*x^2 + 1))/(c^4*
d^2*x^2 - c^2*d^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{a^2x}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x*asin(c
*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x*asin(c*x)/(c**4
*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [B] time = 1.55962, size = 275, normalized size = 3.09

$$-\frac{b^2x^2\arcsin(cx)^2}{2\left(c^2x^2-1\right)d^2} - \frac{abx^2\arcsin(cx)}{\left(c^2x^2-1\right)d^2} - \frac{a^2x^2}{2\left(c^2x^2-1\right)d^2} - \frac{b^2x\arcsin(cx)}{\sqrt{-c^2x^2+1}cd^2} + \frac{b^2\arcsin(cx)^2}{2c^2d^2} - \frac{abx}{\sqrt{-c^2x^2+1}cd^2} + \frac{ab\,\mathrm{ar}}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*b^2*x^2*arcsin(c*x)^2/((c^2*x^2 - 1)*d^2) - a*b*x^2*arcsin(c*x)/((c^2*
x^2 - 1)*d^2) - 1/2*a^2*x^2/((c^2*x^2 - 1)*d^2) - b^2*x*arcsin(c*x)/(sqrt(-
c^2*x^2 + 1)*c*d^2) + 1/2*b^2*arcsin(c*x)^2/(c^2*d^2) - a*b*x/(sqrt(-c^2*x^
2 + 1)*c*d^2) + a*b*arcsin(c*x)/(c^2*d^2) - b^2*log(2)/(c^2*d^2) - 1/2*b^2*
log(abs(-c^2*x^2 + 1))/(c^2*d^2) + 1/2*a^2/(c^2*d^2)
```

3.196 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=230

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd^2}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd^2}-\frac{b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right)}{cd^2}$$

```
[Out] -((b*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c*x
])^2)/(2*d^2*(1 - c^2*x^2)) - (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c
*x])])/(c*d^2) + (b^2*ArcTanh[c*x])/(c*d^2) + (I*b*(a + b*ArcSin[c*x])*Poly
Log[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - (I*b*(a + b*ArcSin[c*x])*PolyLog[
2, I*E^(I*ArcSin[c*x])])/(c*d^2) - (b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])
/(c*d^2) + (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c*d^2)
```

Rubi [A] time = 0.236044, antiderivative size = 230, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4655, 4657, 4181, 2531, 2282, 6589, 4677, 206}

$$\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd^2}-\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{cd^2}-\frac{b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right)}{cd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c*x
])^2)/(2*d^2*(1 - c^2*x^2)) - (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c
*x])])/(c*d^2) + (b^2*ArcTanh[c*x])/(c*d^2) + (I*b*(a + b*ArcSin[c*x])*Poly
Log[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - (I*b*(a + b*ArcSin[c*x])*PolyLog[
2, I*E^(I*ArcSin[c*x])])/(c*d^2) - (b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])
/(c*d^2) + (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c*d^2)
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
```

```
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} + \frac{b^2\int \frac{1}{1-c^2x^2}\,dx}{d^2} + \frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x,\right.}{2cd^2}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2} + \frac{b^2\tanh}{cd}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2} + \frac{b^2\tanh}{cd}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2} + \frac{b^2\tanh}{cd}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2} + \frac{b^2\tanh}{cd}$$

Mathematica [A] time = 2.60353, size = 359, normalized size = 1.56

$$\frac{\frac{2ab\left(2i\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-2i\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\frac{2\left(c^2x^2+\sqrt{1-c^2x^2}+\sin^{-1}(cx)\left(\left(c^2x^2-1\right)\log\left(1-ie^{i\sin^{-1}(cx)}\right)+\left(1-c^2x^2\right)\log\left(1+ie^{i\sin^{-1}(cx)}\right)-cx\right)-1\right)}{c^2x^2-1}\right)}{c} + \frac{4b^2\left(i\sin\right.}{}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((-2*a^2*x)/(-1 + c^2*x^2) - (a^2*Log[1 - c*x])/c + (a^2*Log[1 + c*x])/c +
(2*a*b*((2*(-1 + c^2*x^2 + Sqrt[1 - c^2*x^2] + ArcSin[c*x]*(-(c*x) + (-1 +
c^2*x^2)*Log[1 - I*E^(I*ArcSin[c*x])] + (1 - c^2*x^2)*Log[1 + I*E^(I*ArcSin
[c*x])])))/(-1 + c^2*x^2) + (2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I
)*PolyLog[2, I*E^(I*ArcSin[c*x])]))/c + (4*b^2*(-(ArcSin[c*x]/Sqrt[1 - c^2*
x^2]) + (c*x*ArcSin[c*x]^2)/(2 - 2*c^2*x^2) - I*ArcSin[c*x]^2*ArcTan[E^(I*A
rcSin[c*x])] + ArcTanh[c*x] + I*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x
])] - I*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - PolyLog[3, (-I)*E^(I*
ArcSin[c*x])] + PolyLog[3, I*E^(I*ArcSin[c*x])]))/c)/(4*d^2)
```

Maple [B] time = 0.15, size = 593, normalized size = 2.6

$$-\frac{a^2}{4\,cd^2\,(cx-1)} - \frac{a^2\ln(cx-1)}{4\,cd^2} - \frac{a^2}{4\,cd^2\,(cx+1)} + \frac{a^2\ln(cx+1)}{4\,cd^2} - \frac{b^2\left(\arcsin(cx)\right)^2 x}{2\,d^2\left(c^2x^2-1\right)} + \frac{b^2\arcsin(cx)}{cd^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1} - \frac{b^2\,(a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/4/c*a^2/d^2/(c*x-1)-1/4/c*a^2/d^2*ln(c*x-1)-1/4/c*a^2/d^2/(c*x+1)+1/4/c*
a^2/d^2*ln(c*x+1)-1/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x+1/c*b^2/d^2/(c^2*
```

```
x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/2/c*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I
*c*x+(-c^2*x^2+1)^(1/2)))+I/c*a*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))
-b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2+1/2/c*b^2/d^2*arcsin(c*
x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/c*b^2/d^2*arctan(I*c*x+(-c^2*x^
2+1)^(1/2))+b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-I/c*a*b/d^2*d
ilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*x+1/c*
a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-1/c*a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*
x+(-c^2*x^2+1)^(1/2)))+1/c*a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))+I/c*b^2/d^2*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I/c
*b^2/d^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}\,a^2\left(\frac{2\,x}{c^2d^2x^2-d^2}-\frac{\log(cx+1)}{cd^2}+\frac{\log(cx-1)}{cd^2}\right)-\frac{2\,b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2-\left(b^2c^2x^2-b^2\right)\arctan\left(cx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*x/(c^2*d^2*x^2 - d^2) - log(c*x + 1)/(c*d^2) + log(c*x - 1)/(c*
d^2)) - 1/4*(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - (b^2*
c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) +
(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x +
 1) - 4*(c^3*d^2*x^2 - c*d^2)*integrate(1/2*(4*a*b*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) - (2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
- (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
1) + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*
x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2),
x))/(c^3*d^2*x^2 - c*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^4 - 2*c^2
*d^2*x^2 + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(c^2dx^2 - d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d)^2, x)
```

3.197 $\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=211

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}\right.}}{2d^2}$$

```
[Out] -((b*c*x*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*d^2*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSi
n[c*x])])/d^2 - (b^2*Log[1 - c^2*x^2])/(2*d^2) + (I*b*(a + b*ArcSin[c*x])*P
olyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2
, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2
*d^2) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^2)
```

Rubi [A] time = 0.365164, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4705, 4679, 4419, 4183, 2531, 2282, 6589, 4651, 260}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}\right.}}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((b*c*x*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*d^2*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSi
n[c*x])])/d^2 - (b^2*Log[1 - c^2*x^2])/(2*d^2) + (I*b*(a + b*ArcSin[c*x])*P
olyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2
, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2
*d^2) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^2)
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^2}\,dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)}\,dx}{d}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} + \frac{\text{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx, x, \sin^{-1}\right.}{d^2}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{b^2\log\left(1-c^2x^2\right)}{2d^2} + \frac{2\,\text{Subst}\left(\int (a+bx)^2\csc\right.}{d^2}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{b}{}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{b}{}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{b}{}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{b}{}$$

Mathematica [A] time = 1.27137, size = 365, normalized size = 1.73

$$\frac{2ab\left(i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right) - i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) - \frac{cx}{\sqrt{1-c^2x^2}} + \frac{\sin^{-1}(cx)}{1-c^2x^2} + 2\sin^{-1}(cx)\log\left(1-e^{2i\sin^{-1}(cx)}\right) - 2\,\text{s}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] (a^2/(1 - c^2*x^2) + 2*a^2*Log[c*x] - a^2*Log[1 - c^2*x^2] + 2*a*b*(-((c*x)
/Sqrt[1 - c^2*x^2]) + ArcSin[c*x]/(1 - c^2*x^2) + 2*ArcSin[c*x]*Log[1 - E^(
(2*I)*ArcSin[c*x])] - 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] + I*Poly
Log[2, -E^((2*I)*ArcSin[c*x])] - I*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 2*b
^2*((-I/24)*Pi^3 - (c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + ArcSin[c*x]^2/(2 -
 2*c^2*x^2) + ((2*I)/3)*ArcSin[c*x]^3 + ArcSin[c*x]^2*Log[1 - E^((-2*I)*Arc
Sin[c*x])] - ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - Log[1 - c^2*x^2
]/2 + I*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + I*ArcSin[c*x]*Poly
Log[2, -E^((2*I)*ArcSin[c*x])] + PolyLog[3, E^((-2*I)*ArcSin[c*x])]/2 - Pol
yLog[3, -E^((2*I)*ArcSin[c*x])]/2))/(2*d^2)
```

Maple [B] time = 0.244, size = 829, normalized size = 3.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/2*a^2/d^2*ln(c*x+1)-1/4*a^2/d^2/(c*x-1)+1/4*a^2/d^2/(c*x+1)+2*b^2/d^2*po
lylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+2*b^2/d^2*polylog(3,I*c*x+(-c^2*x^2+1)^(
```

```
1/2))+a^2/d^2*ln(c*x)-b^2/d^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*b^2/d^2*
ln(I*c*x+(-c^2*x^2+1)^(1/2))-1/2*a^2/d^2*ln(c*x-1)-1/2*b^2*polylog(3,-(I*c*
x+(-c^2*x^2+1)^(1/2))^2)/d^2+I*b^2/d^2*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*
x^2+1)^(1/2))^2)-2*I*b^2/d^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2
))-1/2*b^2/d^2*arcsin(c*x)^2/(c^2*x^2-1)-b^2/d^2*arcsin(c*x)^2*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))^2)+b^2/d^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
+b^2/d^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+a*b/d^2/(c^2*x^2-1)*(
-c^2*x^2+1)^(1/2)*c*x+b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c*
x-I*b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*c^2*x^2-I*a*b/d^2/(c^2*x^2-1)*c^2*x^2-2
*I*b^2/d^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*a*b/d^2*arcsin
(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*a*b/d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2
*x^2+1)^(1/2))+I*a*b/d^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*I*a*b/d
^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*a*b/d^2*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))-a*b/d^2*arcsin(c*x)/(c^2*x^2-1)+I*a*b/d^2/(c^2*x^2-1)-2*a*b/d^
2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^2/d^2*arcsin(c*x)/(c^2
*x^2-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a^2\left(\frac{1}{c^2d^2x^2-d^2}+\frac{\log\left(cx+1\right)}{d^2}+\frac{\log\left(cx-1\right)}{d^2}-\frac{2\,\log\left(x\right)}{d^2}\right)+\int\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2\,ab\arctan\left(cx,\right.}{c^4d^2x^5-2\,c^2d^2x^3+d^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(1/(c^2*d^2*x^2 - d^2) + log(c*x + 1)/d^2 + log(c*x - 1)/d^2 - 2*l
og(x)/d^2) + integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 +
2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^4*d^2*x^5 - 2*c^2*d^2*
x^3 + d^2*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2}{c^4d^2x^5-2\,c^2d^2x^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^5 - 2*c^2
*d^2*x^3 + d^2*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{a^2}{c^4x^5-2c^2x^3+x}\,dx+\int\frac{b^2\operatorname{asin}^2\left(cx\right)}{c^4x^5-2c^2x^3+x}\,dx+\int\frac{2ab\operatorname{asin}\left(cx\right)}{c^4x^5-2c^2x^3+x}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(b**2*asin(c*x)*
*2/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(2*a*b*asin(c*x)/(c**4*x**5
- 2*c**2*x**3 + x), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin (cx) + a)^2}{\left(c^2dx^2 - d\right)^2 x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x), x)
```

3.198 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=324

$$\frac{3ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{3ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}+\frac{2ib^2c\text{PolyLog}\left(2,-e^{i\sin\ldots}\right.}{d^2}$$

```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) - (a + b*ArcSin[c*x])^
2/(d^2*x*(1 - c^2*x^2)) + (3*c^2*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x
^2)) - ((3*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (4*b
*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^2 + (b^2*c*ArcTanh[c*x
])/d^2 + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + ((3*I)*b*c*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - ((3*I)*b*c*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - ((2*I)*b^2*c*PolyLog[2
, E^(I*ArcSin[c*x])])/d^2 - (3*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d^
2 + (3*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x])])/d^2
```

Rubi [A] time = 0.563271, antiderivative size = 324, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 14, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.518, Rules used = {4701, 4655, 4657, 4181, 2531, 2282, 6589, 4677, 206, 4705, 4709, 4183, 2279, 2391}

$$\frac{3ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{3ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}+\frac{2ib^2c\text{PolyLog}\left(2,-e^{i\sin\ldots}\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^2),x]
```


```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) - (a + b*ArcSin[c*x])^
2/(d^2*x*(1 - c^2*x^2)) + (3*c^2*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x
^2)) - ((3*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (4*b
*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^2 + (b^2*c*ArcTanh[c*x
])/d^2 + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + ((3*I)*b*c*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - ((3*I)*b*c*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - ((2*I)*b^2*c*PolyLog[2
, E^(I*ArcSin[c*x])])/d^2 - (3*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d^
2 + (3*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x])])/d^2
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
```

```
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^2}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2x\left(1-c^2x^2\right)} + \left(3c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2}$$

$$= \frac{2bc\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\ldots}{d^2}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{2b^2c\tanh^{-1}(cx)}{d^2} + \ldots$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{3ic\left(a+b\sin^{-1}(cx)\ldots\right.}{\ldots}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{3ic\left(a+b\sin^{-1}(cx)\ldots\right.}{\ldots}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{3ic\left(a+b\sin^{-1}(cx)\ldots\right.}{\ldots}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2x\left(1-c^2x^2\right)} + \frac{3c^2x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{3ic\left(a+b\sin^{-1}(cx)\ldots\right.}{\ldots}$$

Mathematica [B] time = 9.5698, size = 1059, normalized size = 3.27

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -(a^2/(d^2*x)) - (a^2*c^2*x)/(2*d^2*(-1 + c^2*x^2)) - (3*a^2*c*Log[1 - c*x]
)/(4*d^2) + (3*a^2*c*Log[1 + c*x])/(4*d^2) + (a*b*c*(-2*ArcSin[c*x]*Cot[Arc
Sin[c*x]/2] + 6*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 6*ArcSin[c*x]*Lo
g[1 + I*E^(I*ArcSin[c*x])] - 4*Log[Cos[ArcSin[c*x]/2]] + 4*Log[Sin[ArcSin[c
*x]/2]] + (6*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (6*I)*PolyLog[2, I*E^(
I*ArcSin[c*x])] + ArcSin[c*x]/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2 -
 (2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin[
c*x]/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (2*Sin[ArcSin[c*x]/2])/(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*ArcSin[c*x]*Tan[ArcSin[c*x]/2]
))/(2*d^2) + (b^2*c*(-4*ArcSin[c*x] - 2*ArcSin[c*x]^2*Cot[ArcSin[c*x]/2] +
8*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]^2*Log[1 - I*E^(I*A
rcSin[c*x])] + 6*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/
(2*E^((I/2)*ArcSin[c*x]))] - 6*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] -
 6*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin
[c*x])] + 6*Pi*ArcSin[c*x]*Log[-((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/(2*E^
((I/2)*ArcSin[c*x]))] - 8*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + 6*ArcSin
[c*x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))
] - 6*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 4*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]] + 6*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin
[ArcSin[c*x]/2]] + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 6*ArcSi
n[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 6*Pi*ArcSin[c*x]*Lo
g[Sin[(Pi + 2*ArcSin[c*x])/4]] + (8*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (12
*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (12*I)*ArcSin[c*x]*Pol
yLog[2, I*E^(I*ArcSin[c*x])] - (8*I)*PolyLog[2, E^(I*ArcSin[c*x])] - 12*Pol
```

```
yLog[3, (-I)*E^(I*ArcSin[c*x])] + 12*PolyLog[3, I*E^(I*ArcSin[c*x])] + ArcS
in[c*x]^2/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2 - (4*ArcSin[c*x]*Sin[
ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin[c*x]^2/(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (4*ArcSin[c*x]*Sin[ArcSin[c*x]
/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*ArcSin[c*x]^2*Tan[ArcSin
[c*x]/2]))/(4*d^2)
```

Maple [B] time = 0.301, size = 778, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -2*c*a*b/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/2*c*b^2/d^2*arcsin(c*x)^2*ln(
1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*c*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(
-c^2*x^2+1)^(1/2)))-2*c*b^2/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+
b^2/d^2/(c^2*x^2-1)/x*arcsin(c*x)^2+2*I*c*b^2/d^2*dilog(1+I*c*x+(-c^2*x^2+1
)^(1/2))-2*I*c*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-a^2/d^2/x+2*c*a*b/d
^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-3*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^
(1/2)))/d^2+3*b^2*c*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2+2*I*c*b^2/d
^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-1/4*c*a^2/d^2/(c*x+1)-1/4*c*a^2/d^2/(c*x
-1)-3/4*c*a^2/d^2*ln(c*x-1)+3/4*c*a^2/d^2*ln(c*x+1)+c*a*b/d^2/(c^2*x^2-1)*(
-c^2*x^2+1)^(1/2)-3*c*a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))
)-3/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c^2*x+2*a*b/d^2/(c^2*x^2-1)/x*arcsi
n(c*x)-3*I*c*a*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*I*c*b^2/d^2*ar
csin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*I*c*b^2/d^2*arcsin(c*x
)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*I*c*a*b/d^2*dilog(1+I*(I*c*x+(-
c^2*x^2+1)^(1/2)))+3*c*a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))+c*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-3*a*b/d^2/(c^2*x^2-
1)*arcsin(c*x)*c^2*x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}\,a^2\left(\frac{2\left(3\,c^2x^2-2\right)}{c^2d^2x^3-d^2x}-\frac{3\,c\log\left(cx+1\right)}{d^2}+\frac{3\,c\log\left(cx-1\right)}{d^2}\right)+\frac{3\left(b^2c^3x^3-b^2cx\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2\log\left(cx+1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*(3*c^2*x^2 - 2)/(c^2*d^2*x^3 - d^2*x) - 3*c*log(c*x + 1)/d^2 +
3*c*log(c*x - 1)/d^2) + 1/4*(3*(b^2*c^3*x^3 - b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*(b^2*c^3*x^3 - b^2*c*x)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(3*b^2*c^2*x^2 - 2*b^
2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^2*d^2*x^3 - d^2*x)*i
ntegrate(1/2*(4*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (3*(b^2*c^
4*x^4 - b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1
) - 3*(b^2*c^4*x^4 - b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 2*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^6 - 2*c^2*d^2*x^4
 + d^2*x^2), x))/(c^2*d^2*x^3 - d^2*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\arcsin(cx)^2 + 2\,ab\arcsin(cx) + a^2}{c^4d^2x^6 - 2\,c^2d^2x^4 + d^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^6 - 2*c^2
*d^2*x^4 + d^2*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{a^2}{c^4x^6-2c^2x^4+x^2}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^4x^6-2c^2x^4+x^2}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^4x^6-2c^2x^4+x^2}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**6 - 2*c**2*x**4 + x**2), x))/d**2
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: AttributeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Exception raised: AttributeError
```

3.199 $\int \frac{(a+b\sin^{-1}(cx))^2}{x^3(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=270

$$\frac{2ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{2ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{b^2c^2\text{PolyLog}\left(3,-e^{2}\right.}{d^2}$$

```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sqrt[1 - c^2*x^2])) + (c^2*(a + b*ArcSin
[c*x])^2)/(d^2*(1 - c^2*x^2)) - (a + b*ArcSin[c*x])^2/(2*d^2*x^2*(1 - c^2*x
^2)) - (4*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (
b^2*c^2*Log[x])/d^2 - (b^2*c^2*Log[1 - c^2*x^2])/(2*d^2) + ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*c^2*PolyLog[
3, -E^((2*I)*ArcSin[c*x])])/d^2 + (b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*x])
])/d^2
```

Rubi [A] time = 0.550665, antiderivative size = 270, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4701, 4705, 4679, 4419, 4183, 2531, 2282, 6589, 4651, 260, 271, 191, 4689, 446, 72}

$$\frac{2ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{2ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{b^2c^2\text{PolyLog}\left(3,-e^{2}\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^2),x]
```


```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sqrt[1 - c^2*x^2])) + (c^2*(a + b*ArcSin
[c*x])^2)/(d^2*(1 - c^2*x^2)) - (a + b*ArcSin[c*x])^2/(2*d^2*x^2*(1 - c^2*x
^2)) - (4*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (
b^2*c^2*Log[x])/d^2 - (b^2*c^2*Log[1 - c^2*x^2])/(2*d^2) + ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*c^2*PolyLog[
3, -E^((2*I)*ArcSin[c*x])])/d^2 + (b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*x])
])/d^2
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
```

```
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
```

```
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^2}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} + \left(2c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^2}\,dx + \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}} + \frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2\left(1-c^2x^2\right)} - \frac{\left(a+b\sin^{-1}(cx)\right)}{2d^2x^2\left(1-c^2x^2\right)}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2\left(1-c^2x^2\right)} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} + \left(2c^2\right)\text{Subst}\left(\int(a+b\right.$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2\left(1-c^2x^2\right)} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{b^2c^2\log\left(1-c^2x^2\right)}{d^2} +$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2\left(1-c^2x^2\right)} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2\left(1-c^2x^2\right)} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2\left(1-c^2x^2\right)} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2\left(1-c^2x^2\right)} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)^2}{d^2}$$

Mathematica [A] time = 1.55839, size = 430, normalized size = 1.59

$$\frac{2ab\left(2c^2\left(i\left(\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)-\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right)+2\sin^{-1}(cx)\left(\log\left(1-e^{2i\sin^{-1}(cx)}\right)-\log\left(1+e^{2i\sin^{-1}}\right.\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] (-(a^2/x^2) + (a^2*c^2)/(1 - c^2*x^2) + 4*a^2*c^2*Log[x] - 2*a^2*c^2*Log[1
- c^2*x^2] + 2*a*b*(-((c^3*x)/Sqrt[1 - c^2*x^2]) - (c*Sqrt[1 - c^2*x^2])/x
- ArcSin[c*x]/x^2 + (c^2*ArcSin[c*x])/(1 - c^2*x^2) + 2*c^2*(2*ArcSin[c*x]*
(Log[1 - E^((2*I)*ArcSin[c*x])] - Log[1 + E^((2*I)*ArcSin[c*x])]) + I*(Poly
Log[2, -E^((2*I)*ArcSin[c*x])] - PolyLog[2, E^((2*I)*ArcSin[c*x])]))) + b^2
*c^2*((-2*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*Sqrt[1 - c^2*x^2]*ArcSin[
c*x])/(c*x) - ArcSin[c*x]^2/(c^2*x^2) + ArcSin[c*x]^2/(1 - c^2*x^2) + 4*Arc
Sin[c*x]^2*(Log[1 - E^((2*I)*ArcSin[c*x])] - Log[1 + E^((2*I)*ArcSin[c*x])]
) + 2*Log[(c*x)/Sqrt[1 - c^2*x^2]] + (4*I)*ArcSin[c*x]*(PolyLog[2, -E^((2*I
)*ArcSin[c*x])] - PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 2*(-PolyLog[3, -E^((
2*I)*ArcSin[c*x])] + PolyLog[3, E^((2*I)*ArcSin[c*x])])))/(2*d^2)
```

Maple [B] time = 0.246, size = 903, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/2*a^2/d^2/x^2-4*I*c^2*a*b/d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*c^
2*a*b/d^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4*I*c^2*b^2/d^2*arcsin(c
*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-4*I*c^2*b^2/d^2*arcsin(c*x)*polylo
g(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*c^2*b^2/d^2*arcsin(c*x)*polylog(2,-(I*c*x
+(-c^2*x^2+1)^(1/2))^2)-4*I*c^2*a*b/d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)+4*c^2*a*b/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*c^2*a*b/d^2*ar
csin(c*x)/(c^2*x^2-1)-4*c^2*a*b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1
/2))^2)+4*c^2*a*b/d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+a*b/d^2/(c
^2*x^2-1)/x^2*arcsin(c*x)-1/4*c^2*a^2/d^2/(c*x-1)+4*c^2*b^2/d^2*polylog(3,I
*c*x+(-c^2*x^2+1)^(1/2))+2*c^2*a^2/d^2*ln(c*x)+c^2*b^2/d^2*ln(I*c*x+(-c^2*x
^2+1)^(1/2)-1)+c^2*b^2/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-c^2*b^2/d^2*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)-c^2*a^2/d^2*ln(c*x-1)-c^2*a^2/d^2*ln(c*x+1)+4
*c^2*b^2/d^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+1/4*c^2*a^2/d^2/(c*x+1)+1
/2*b^2/d^2/(c^2*x^2-1)/x^2*arcsin(c*x)^2-b^2*c^2*polylog(3,-(I*c*x+(-c^2*x^
2+1)^(1/2))^2)/d^2+2*c^2*b^2/d^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2
))-c^2*b^2/d^2*arcsin(c*x)^2/(c^2*x^2-1)-2*c^2*b^2/d^2*arcsin(c*x)^2*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*c^2*b^2/d^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x
^2+1)^(1/2))+c*b^2/d^2/(c^2*x^2-1)/x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+c*a*b/d
^2/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}a^2\left(\frac{2c^2\log(cx+1)}{d^2}+\frac{2c^2\log(cx-1)}{d^2}-\frac{4c^2\log(x)}{d^2}+\frac{2c^2x^2-1}{c^2d^2x^4-d^2x^2}\right)+\int\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2ab}{c^4d^2x^7-2c^2d^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(2*c^2*log(c*x + 1)/d^2 + 2*c^2*log(c*x - 1)/d^2 - 4*c^2*log(x)/d^
2 + (2*c^2*x^2 - 1)/(c^2*d^2*x^4 - d^2*x^2)) + integrate((b^2*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2}{c^4d^2x^7-2c^2d^2x^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^7 - 2*c^2
*d^2*x^5 + d^2*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{a^2}{c^4x^7-2c^2x^5+x^3}\,dx+\int\frac{b^2\operatorname{asin}^2(cx)}{c^4x^7-2c^2x^5+x^3}\,dx+\int\frac{2ab\operatorname{asin}(cx)}{c^4x^7-2c^2x^5+x^3}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**7 - 2*c**2*x**5 + x**3), x))/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(c^2dx^2 - d)^2 x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x^3), x)
```

3.200 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^2}\,dx$

Optimal. Leaf size=439

$$\frac{5ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{5ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}+\frac{13ib^2c^3\text{PolyLog}\left(2,\right.}{3d^2}$$

```
[Out] -(b^2*c^2)/(3*d^2*x) - (2*b*c^3*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1 - c^2*x^
2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcS
in[c*x])^2/(3*d^2*x^3*(1 - c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x])^2)/(3*d^2
*x*(1 - c^2*x^2)) + (5*c^4*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2)) -
 ((5*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (26*b*c^
3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^2) + (b^2*c^3*ArcTan
h[c*x])/d^2 + (((13*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + ((5
*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - ((5
*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - (((13*
I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^2 - (5*b^2*c^3*PolyLog[3, (-
I)*E^(I*ArcSin[c*x])])/d^2 + (5*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])])/d^
2
```

Rubi [A] time = 0.949499, antiderivative size = 439, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4701, 4655, 4657, 4181, 2531, 2282, 6589, 4677, 206, 4705, 4709, 4183, 2279, 2391, 325}

$$\frac{5ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}-\frac{5ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2}+\frac{13ib^2c^3\text{PolyLog}\left(2,\right.}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^2),x]
```


```
[Out] -(b^2*c^2)/(3*d^2*x) - (2*b*c^3*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1 - c^2*x^
2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcS
in[c*x])^2/(3*d^2*x^3*(1 - c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x])^2)/(3*d^2
*x*(1 - c^2*x^2)) + (5*c^4*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2)) -
 ((5*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (26*b*c^
3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^2) + (b^2*c^3*ArcTan
h[c*x])/d^2 + (((13*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + ((5
*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - ((5
*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - (((13*
I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^2 - (5*b^2*c^3*PolyLog[3, (-
I)*E^(I*ArcSin[c*x])])/d^2 + (5*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])])/d^
2
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
```

```
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^2}dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} + \frac{1}{3}\left(5c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^2}dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x^3\left(1-c^2x^2\right)^{3/2}}dx}{3d^2}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} - \frac{5c^2\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x\left(1-c^2x^2\right)} + \left(5c^4\right)\int \frac{\left(a+b\sin^{-1}\right.}{\left(d-c^2dx\right.}$$

$$= -\frac{b^2c^2}{3d^2x} + \frac{13bc^3\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} - \frac{5c^2\left(a+b\,\mathrm{s}\right.}{3d^2x\left(1\right.}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} - \frac{5c^2\left(a+b\,\mathrm{si}\right.}{3d^2x\left(1-\right.}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} - \frac{5c^2\left(a+b\,\mathrm{si}\right.}{3d^2x\left(1-\right.}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} - \frac{5c^2\left(a+b\,\mathrm{si}\right.}{3d^2x\left(1-\right.}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} - \frac{5c^2\left(a+b\,\mathrm{si}\right.}{3d^2x\left(1-\right.}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^2x^3\left(1-c^2x^2\right)} - \frac{5c^2\left(a+b\,\mathrm{si}\right.}{3d^2x\left(1-\right.}$$

Mathematica [B] time = 12.9268, size = 1514, normalized size = 3.45

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -a^2/(3*d^2*x^3) - (2*a^2*c^2)/(d^2*x) - (a^2*c^4*x)/(2*d^2*(-1 + c^2*x^2))
 - (5*a^2*c^3*Log[1 - c*x])/(4*d^2) + (5*a^2*c^3*Log[1 + c*x])/(4*d^2) + (2
*a*b*((c^3*(Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(4*(-1 + c*x)) - (c^4*(Sqrt[1
 - c^2*x^2] + ArcSin[c*x]))/(4*(c + c^2*x)) + 2*c^2*(-(ArcSin[c*x]/x) - c*A
rcTanh[Sqrt[1 - c^2*x^2]]) - (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x
^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*x^3) - (5*c^4*((((3*I)/2)*Pi*ArcSin[c*x])
/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi
*Log[1 + I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x
])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x
])/4]])/c - ((2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c))/4 + (5*c^4*(((I/
2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcS
in[c*x])])/c + (Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 -
 I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(
Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/4)
)/d^2 + (b^2*c^3*((5*ArcSin[c*x]^3)/6 + ((-2*Cos[ArcSin[c*x]/2] - 13*ArcSin
[c*x]^2*Cos[ArcSin[c*x]/2])*Csc[ArcSin[c*x]/2])/12 - (ArcSin[c*x]*Csc[ArcSi
n[c*x]/2]^2)/12 - (ArcSin[c*x]^2*Cot[ArcSin[c*x]/2]*Csc[ArcSin[c*x]/2]^2)/2
4 + (26*((I/8)*ArcSin[c*x]^2 - (ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])])/2 +
 (I/2)*PolyLog[2, -E^(I*ArcSin[c*x])]))/3 + (26*((ArcSin[c*x]*Log[1 - E^(I*
ArcSin[c*x])])/2 - (I/2)*(ArcSin[c*x]^2/4 + PolyLog[2, E^(I*ArcSin[c*x])]))
```

```
)/3 + (-6*ArcSin[c*x] - 5*ArcSin[c*x]^3 + 15*ArcSin[c*x]^2*Log[1 - I*E^(I*A
rcSin[c*x])] + 15*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))
/(2*E^((I/2)*ArcSin[c*x]))] - 15*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])]
 - 15*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*Arc
Sin[c*x])] + 15*Pi*ArcSin[c*x]*Log[-((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/(
2*E^((I/2)*ArcSin[c*x]))] + 15*ArcSin[c*x]^2*Log[((1 + I) + (1 - I)*E^(I*Ar
cSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] - 15*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2
*ArcSin[c*x])/4]] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 15*Arc
Sin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 6*Log[Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2]] - 15*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2]] - 15*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (
30*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (30*I)*ArcSin[c*x]*P
olyLog[2, I*E^(I*ArcSin[c*x])] - 30*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 30
*PolyLog[3, I*E^(I*ArcSin[c*x])])/6 + (ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2)/12
 + ArcSin[c*x]^2/(4*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) - (ArcSin[
c*x]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin
[c*x]^2/(4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (ArcSin[c*x]*Sin[
ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (Sec[ArcSin[c*x
]/2]*(-2*Sin[ArcSin[c*x]/2] - 13*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2]))/12 - (A
rcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2*Tan[ArcSin[c*x]/2])/24))/d^2
```

Maple [B] time = 0.382, size = 1019, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x)
```

```
[Out] -1/3*c^4*b^2/d^2*x/(c^2*x^2-1)+5/3*c^2*b^2/d^2/(c^2*x^2-1)/x*arcsin(c*x)^2-
5/2*c^4*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x+2/3*a*b/d^2/x^3/(c^2*x^2-1)*arc
sin(c*x)+5*I*c^3*b^2/d^2*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))-5*I*c^3*b^2/d^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5*I*
c^3*a*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5*I*c^3*a*b/d^2*dilog(1+I
*(I*c*x+(-c^2*x^2+1)^(1/2)))-5/4*c^3*a^2/d^2*ln(c*x-1)+5/4*c^3*a^2/d^2*ln(c
*x+1)+2/3*c^3*a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-5*c^3*a*b/d^2*arcsin(c
*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5*c^3*a*b/d^2*arcsin(c*x)*ln(1-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))+2/3*c^3*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)-1/3*a^2/d^2/x^3+1/3*c^2*b^2/d^2/x/(c^2*x^2-1)+1/3*b^2/d^2/x^3/(c^2
*x^2-1)*arcsin(c*x)^2+13/3*c^3*a*b/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-13/3*
c^3*a*b/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-5/2*c^3*b^2/d^2*arcsin(c*x)^2*ln
(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/2*c^3*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*
x+(-c^2*x^2+1)^(1/2)))-13/3*c^3*b^2/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))-2*I*c^3*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+13/3*I*c^3*b^2/d^2
*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+13/3*I*c^3*b^2/d^2*dilog(1+I*c*x+(-c^2*x^2
+1)^(1/2))+1/3*c*b^2/d^2/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/3
*c*a*b/d^2/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-5*c^4*a*b/d^2/(c^2*x^2-1)*arc
sin(c*x)*x+10/3*c^2*a*b/d^2/(c^2*x^2-1)/x*arcsin(c*x)-5*b^2*c^3*polylog(3,-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2+5*b^2*c^3*polylog(3,I*(I*c*x+(-c^2*x^2+1)
^(1/2)))/d^2-1/4*c^3*a^2/d^2/(c*x+1)-2*c^2*a^2/d^2/x-1/4*c^3*a^2/d^2/(c*x-1
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{12}\left(\frac{15\,c^3\log\left(cx+1\right)}{d^2}-\frac{15\,c^3\log\left(cx-1\right)}{d^2}-\frac{2\left(15\,c^4x^4-10\,c^2x^2-2\right)}{c^2d^2x^5-d^2x^3}\right)a^2+\frac{15\left(b^2c^5x^5-b^2c^3x^3\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/12*(15*c^3*log(c*x + 1)/d^2 - 15*c^3*log(c*x - 1)/d^2 - 2*(15*c^4*x^4 - 1
0*c^2*x^2 - 2)/(c^2*d^2*x^5 - d^2*x^3))*a^2 + 1/12*(15*(b^2*c^5*x^5 - b^2*c
^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 15*(b^2
*c^5*x^5 - b^2*c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c
*x + 1) - 2*(15*b^2*c^4*x^4 - 10*b^2*c^2*x^2 - 2*b^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))^2 + 12*(c^2*d^2*x^5 - d^2*x^3)*integrate(1/6*(12*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (15*(b^2*c^6*x^6 - b^2*c^4*x^4
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(b^2*c^6*x^6
 - b^2*c^4*x^4)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) -
2*(15*b^2*c^5*x^5 - 10*b^2*c^3*x^3 - 2*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^8 - 2*c^2*d^2*x^6
 + d^2*x^4), x))/(c^2*d^2*x^5 - d^2*x^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2}{c^4d^2x^8-2\,c^2d^2x^6+d^2x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^8 - 2*c^2
*d^2*x^6 + d^2*x^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{a^2}{c^4x^8-2c^2x^6+x^4}\,dx+\int\frac{b^2\operatorname{asin}^2\left(cx\right)}{c^4x^8-2c^2x^6+x^4}\,dx+\int\frac{2ab\operatorname{asin}\left(cx\right)}{c^4x^8-2c^2x^6+x^4}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**8 - 2*c**2*x**6 + x**4), x))/d**2
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.201 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=343

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3}-\frac{3b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right)}{4c^5d^3}$$

```
[Out] (b^2*x)/(12*c^4*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^5*d^3*(1
- c^2*x^2)^(3/2)) + (5*b*(a + b*ArcSin[c*x]))/(4*c^5*d^3*Sqrt[1 - c^2*x^2])
 + (x^3*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*Ar
cSin[c*x])^2)/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*
ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^3) - (7*b^2*ArcTanh[c*x])/(6*c^5*d^3) + (
((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^
3) - (((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5
*d^3) - (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^5*d^3) + (3*b^2*Pol
yLog[3, I*E^(I*ArcSin[c*x])])/(4*c^5*d^3)
```

Rubi [A] time = 0.536364, antiderivative size = 343, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 13, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.482, Rules used = {4703, 4657, 4181, 2531, 2282, 6589, 4677, 206, 266, 43, 4689, 12, 385}

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3}-\frac{3b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right)}{4c^5d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```


```
[Out] (b^2*x)/(12*c^4*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^5*d^3*(1
- c^2*x^2)^(3/2)) + (5*b*(a + b*ArcSin[c*x]))/(4*c^5*d^3*Sqrt[1 - c^2*x^2])
 + (x^3*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*Ar
cSin[c*x])^2)/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*
ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^3) - (7*b^2*ArcTanh[c*x])/(6*c^5*d^3) + (
((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^
3) - (((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5
*d^3) - (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^5*d^3) + (3*b^2*Pol
yLog[3, I*E^(I*ArcSin[c*x])])/(4*c^5*d^3)
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> -S
imp[((b*c - a*d)*x*(a + b*x^n)^(p + 1))/(a*b*n*(p + 1)), x] - Dist[(a*d - b
*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; Fre
eQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n +
 p, 0])
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx=\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{b\int\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2cd^3}-\frac{3\int\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx}{4c^2d}$$

$$=-\frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{b\left(a+b\sin^{-1}(cx)\right)}{2c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x\left(a+b\sin^{-1}(cx)\right.}{8c^4d^3\left(1-c^2x^2\right)}$$

$$=-\frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x\left(a+b\sin^{-1}(cx\right.}{8c^4d^3\left(1-c^2x^2\right.}$$

$$=\frac{b^2x}{12c^4d^3\left(1-c^2x^2\right)}-\frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}-$$

$$=\frac{b^2x}{12c^4d^3\left(1-c^2x^2\right)}-\frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}-$$

$$=\frac{b^2x}{12c^4d^3\left(1-c^2x^2\right)}-\frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}-$$

$$=\frac{b^2x}{12c^4d^3\left(1-c^2x^2\right)}-\frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b\left(a+b\sin^{-1}(cx)\right)}{4c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}-$$

Mathematica [A] time = 6.37722, size = 667, normalized size = 1.94

$$18ab\left(4i\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+i\sin^{-1}(cx)^2+\sin^{-1}(cx)\left(-4\log\left(1+ie^{i\sin^{-1}(cx)}\right)-3i\pi\right)+2\pi\left(-2\log\left(1+e^{-i\sin^{-1}(cx)}\right)\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((24*a^2*c*x)/(-1 + c^2*x^2)^2 + (60*a^2*c*x)/(-1 + c^2*x^2) - (60*a*b*(Sqr
t[1 - c^2*x^2] - ArcSin[c*x]))/(-1 + c*x) + (60*a*b*(Sqrt[1 - c^2*x^2] + Ar
cSin[c*x]))/(1 + c*x) + (4*a*b*((-2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x
]))/(-1 + c*x)^2 - (4*a*b*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(1
 + c*x)^2 - 18*a^2*Log[1 - c*x] + 18*a^2*Log[1 + c*x] + 18*a*b*(I*ArcSin[c*
x]^2 + ArcSin[c*x]*((-3*I)*Pi - 4*Log[1 + I*E^(I*ArcSin[c*x])]) + 2*Pi*(-2*
Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 + I*E^(I*ArcSin[c*x])] + 2*Log[Cos[Ar
cSin[c*x]/2]] - Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])]) + 18*a*b*((-I)*ArcSin[c*x]^2 + ArcSin[c*x]*(I*Pi + 4*Lo
g[1 - I*E^(I*ArcSin[c*x])]) + 2*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1
 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSi
n[c*x])/4]]) - (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]) + 8*b^2*((-9*I)*ArcSi
n[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] - 14*ArcTanh[c*x] + (9*I)*ArcSin[c*x]*Po
lyLog[2, (-I)*E^(I*ArcSin[c*x])] - (9*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcS
in[c*x])] - 9*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 9*PolyLog[3, I*E^(I*ArcS
in[c*x])]) + (b^2*(ArcSin[c*x]*(74*Sqrt[1 - c^2*x^2] + 30*Cos[3*ArcSin[c*x]
]) + 3*ArcSin[c*x]^2*(3*c*x - 5*Sin[3*ArcSin[c*x]]) + 2*(c*x + Sin[3*ArcSin
[c*x]])))/(-1 + c^2*x^2)^2)/(96*c^5*d^3)
```

Maple [B] time = 0.547, size = 903, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 13/12/c^5*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-3/4/c^5*a*b/d^3*
arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4/c^5*a*b/d^3*arcsin(c*x)*
ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+13/12/c^5*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*
arcsin(c*x)*(-c^2*x^2+1)^(1/2)+3/4*I/c^5*a*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2
+1)^(1/2)))-3/4*I/c^5*a*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I/c
^5*b^2/d^3*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/4*I/c^5*b
^2/d^3*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/8/c^2*b^2/d^3/
(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x^3-3/8/c^4*b^2/d^3/(c^4*x^4-2*c^2*x^2+
1)*arcsin(c*x)^2*x-3/4*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3
+3/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3-5/4/c^3*a*b/d^3/(c
^4*x^4-2*c^2*x^2+1)*x^2*(-c^2*x^2+1)^(1/2)-3/4/c^4*a*b/d^3/(c^4*x^4-2*c^2*x
^2+1)*arcsin(c*x)*x-5/4/c^3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)*x^2+5/4/c^2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x^3+3/8
/c^5*b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7/3*I/c^5*b^2
/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+1/12/c^4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1
)*x-1/12/c^2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*x^3-3/8/c^5*b^2/d^3*arcsin(c*x)^
2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/16/c^5*a^2/d^3/(c*x-1)^2+5/16/c^5*a^
2/d^3/(c*x-1)-1/16/c^5*a^2/d^3/(c*x+1)^2+5/16/c^5*a^2/d^3/(c*x+1)-3/16/c^5*
a^2/d^3*ln(c*x-1)+3/16/c^5*a^2/d^3*ln(c*x+1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{16}a^2\left(\frac{2(5c^2x^3-3x)}{c^8d^3x^4-2c^6d^3x^2+c^4d^3}+\frac{3\log(cx+1)}{c^5d^3}-\frac{3\log(cx-1)}{c^5d^3}\right)+\frac{3(b^2c^4x^4-2b^2c^2x^2+b^2)\arctan\left(cx,\sqrt{cx+1}\sqrt{\cdot}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a^2*(2*(5*c^2*x^3 - 3*x)/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 3*l
og(c*x + 1)/(c^5*d^3) - 3*log(c*x - 1)/(c^5*d^3)) + 1/16*(3*(b^2*c^4*x^4 -
2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x +
 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2*log(-c*x + 1) + 2*(5*b^2*c^3*x^3 - 3*b^2*c*x)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))^2 + 16*(c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)*
integrate(-1/8*(16*a*b*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) -
 (3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))*log(c*x + 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*(5*b^2*c^3*x^3 - 3*b^2*c*x)*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(
c^10*d^3*x^6 - 3*c^8*d^3*x^4 + 3*c^6*d^3*x^2 - c^4*d^3), x))/(c^9*d^3*x^4 -
 2*c^7*d^3*x^2 + c^5*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2x^4\arcsin(cx)^2+2\,abx^4\arcsin(cx)+a^2x^4}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^6*d^
3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a^2x^4}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{b^2x^4\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{2abx^4\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**4/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**4*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**4*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

3.202 $\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=172

$$\frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2}-\frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx\left(a+b\sin^{-1}(cx)\right)}{2c^3d^3\sqrt{1-c^2x^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d^3}+\frac{b^2}{12c^4d^3\left(1-c^2x^2\right)}+\frac{b^2\log}{}$$

```
[Out] b^2/(12*c^4*d^3*(1 - c^2*x^2)) - (b*x^3*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 -
c^2*x^2)^(3/2)) + (b*x*(a + b*ArcSin[c*x]))/(2*c^3*d^3*Sqrt[1 - c^2*x^2]) -
 (a + b*ArcSin[c*x])^2/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x])^2)/(4*d^3*(1
- c^2*x^2)^2) + (b^2*Log[1 - c^2*x^2])/(3*c^4*d^3)
```

Rubi [A] time = 0.33432, antiderivative size = 172, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4681, 4703, 4641, 260, 266, 43}

$$\frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2}-\frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx\left(a+b\sin^{-1}(cx)\right)}{2c^3d^3\sqrt{1-c^2x^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d^3}+\frac{b^2}{12c^4d^3\left(1-c^2x^2\right)}+\frac{b^2\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```


```
[Out] b^2/(12*c^4*d^3*(1 - c^2*x^2)) - (b*x^3*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 -
c^2*x^2)^(3/2)) + (b*x*(a + b*ArcSin[c*x]))/(2*c^3*d^3*Sqrt[1 - c^2*x^2]) -
 (a + b*ArcSin[c*x])^2/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x])^2)/(4*d^3*(1
- c^2*x^2)^2) + (b^2*Log[1 - c^2*x^2])/(3*c^4*d^3)
```


Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
```

```
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2d^3}$$

$$= -\frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{b^2\int \frac{x^3}{\left(1-c^2x^2\right)^2}\,dx}{6d^3} + \frac{b\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^3}$$

$$= -\frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{bx\left(a+b\sin^{-1}(cx)\right)}{2c^3d^3\sqrt{1-c^2x^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{b^2\,\mathrm{Subst}\left(\int \frac{x}{\left(1-c^2x\right)}\right.}{12d^3}$$

$$= -\frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{bx\left(a+b\sin^{-1}(cx)\right)}{2c^3d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d^3} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2}$$

$$= \frac{b^2}{12c^4d^3\left(1-c^2x^2\right)} - \frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{bx\left(a+b\sin^{-1}(cx)\right)}{2c^3d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^4d^3} + \frac{x^4}{}$$

Mathematica [A] time = 0.186361, size = 192, normalized size = 1.12

$$\frac{6a^2c^2x^2 - 3a^2 - 8abc^3x^3\sqrt{1-c^2x^2} + 6abcx\sqrt{1-c^2x^2} + 2b\sin^{-1}(cx)\left(a\left(6c^2x^2-3\right) + bcx\sqrt{1-c^2x^2}\left(3-4c^2x^2\right)\right) - b^2c^2x^2}{12c^4d^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (-3*a^2 + b^2 + 6*a^2*c^2*x^2 - b^2*c^2*x^2 + 6*a*b*c*x*Sqrt[1 - c^2*x^2] -
 8*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*(b*c*x*(3 - 4*c^2*x^2)*Sqrt[1 - c^2*
x^2] + a*(-3 + 6*c^2*x^2))*ArcSin[c*x] + 3*b^2*(-1 + 2*c^2*x^2)*ArcSin[c*x]
```

```
^2 + 4*b^2*(-1 + c^2*x^2)^2*Log[1 - c^2*x^2])/(12*c^4*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] time = 0.353, size = 472, normalized size = 2.7

$$\frac{a^2}{16\,c^4d^3\,(cx-1)^2}+\frac{3\,a^2}{16\,c^4d^3\,(cx-1)}+\frac{a^2}{16\,c^4d^3\,(cx+1)^2}-\frac{3\,a^2}{16\,c^4d^3\,(cx+1)}+\frac{b^2\,(\arcsin(cx))^2}{4\,c^4d^3\,(c^2x^2-1)^2}-\frac{b^2\arcsin(cx)\,x}{6\,c^3d^3\,(c^2x^2-1)^2}\sqrt{-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16/c^4*a^2/d^3/(c*x-1)^2+3/16/c^4*a^2/d^3/(c*x-1)+1/16/c^4*a^2/d^3/(c*x+1
)^2-3/16/c^4*a^2/d^3/(c*x+1)+1/4/c^4*b^2/d^3*arcsin(c*x)^2/(c^2*x^2-1)^2-1/
6/c^3*b^2/d^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)^2*x-1/12/c^4*b^2/d
^3/(c^2*x^2-1)-2/3/c^3*b^2/d^3*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x
+1/3*b^2*ln(-c^2*x^2+1)/c^4/d^3+1/2/c^4*b^2/d^3*arcsin(c*x)^2/(c^2*x^2-1)+1
/8/c^4*a*b/d^3*arcsin(c*x)/(c*x-1)^2+3/8/c^4*a*b/d^3*arcsin(c*x)/(c*x-1)+1/
8/c^4*a*b/d^3*arcsin(c*x)/(c*x+1)^2-3/8/c^4*a*b/d^3*arcsin(c*x)/(c*x+1)-1/3
/c^4*a*b/d^3/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)-1/3/c^4*a*b/d^3/(c*x+1)*(-(
c*x+1)^2+2*c*x+2)^(1/2)-1/24/c^4*a*b/d^3/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/
2)+1/24/c^4*a*b/d^3/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{(2\,c^2x^2-1)a^2}{4\,(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3)}+\frac{(2\,b^2c^2x^2-b^2)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2-2\,(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3)\int\frac{4\,abc^3x}{}}{4\,(c^8d^3x^4-2\,c^6d^3x^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(2*c^2*x^2 - 1)*a^2/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 1/4*((2*b
^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^8*d^3
*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)*integrate(-1/2*(4*a*b*c^3*x^3*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1)) - (2*b^2*c^2*x^2 - b^2)*sqrt(c*x + 1)*sqrt(-c
*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^9*d^3*x^6 - 3*c^7*d^
3*x^4 + 3*c^5*d^3*x^2 - c^3*d^3), x))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^
3)
```

Fricas [A] time = 2.65076, size = 421, normalized size = 2.45

$$\frac{(6\,a^2-b^2)c^2x^2+3\,(2\,b^2c^2x^2-b^2)\arcsin(cx)^2-3\,a^2+b^2+6\,(2\,abc^2x^2-ab)\arcsin(cx)+4\,(b^2c^4x^4-2\,b^2c^2x^2+b^2)}{12\,(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/12*((6*a^2 - b^2)*c^2*x^2 + 3*(2*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - 3*a^2
 + b^2 + 6*(2*a*b*c^2*x^2 - a*b)*arcsin(c*x) + 4*(b^2*c^4*x^4 - 2*b^2*c^2*x
```

```
^2 + b^2)*log(c^2*x^2 - 1) - 2*(4*a*b*c^3*x^3 - 3*a*b*c*x + (4*b^2*c^3*x^3
- 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2
+ c^4*d^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a^2x^3}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{2abx^3\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**3/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**3*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**3*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Giac [B] time = 2.13606, size = 429, normalized size = 2.49

$$\frac{b^2x^4\arcsin(cx)^2}{4(c^2x^2-1)^2d^3} + \frac{abx^4\arcsin(cx)}{2(c^2x^2-1)^2d^3} + \frac{a^2x^4}{4(c^2x^2-1)^2d^3} + \frac{b^2x^3\arcsin(cx)}{6(c^2x^2-1)\sqrt{-c^2x^2+1}cd^3} + \frac{abx^3}{6(c^2x^2-1)\sqrt{-c^2x^2+1}cd^3} - \frac{}{12(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b^2*x^4*arcsin(c*x)^2/((c^2*x^2 - 1)^2*d^3) + 1/2*a*b*x^4*arcsin(c*x)/(
(c^2*x^2 - 1)^2*d^3) + 1/4*a^2*x^4/((c^2*x^2 - 1)^2*d^3) + 1/6*b^2*x^3*arcs
in(c*x)/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*c*d^3) + 1/6*a*b*x^3/((c^2*x^2 -
1)*sqrt(-c^2*x^2 + 1)*c*d^3) - 1/12*b^2*x^2/((c^2*x^2 - 1)*c^2*d^3) + 1/2*b
^2*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1)*c^3*d^3) - 1/4*b^2*arcsin(c*x)^2/(c^4*
d^3) + 1/2*a*b*x/(sqrt(-c^2*x^2 + 1)*c^3*d^3) - 1/2*a*b*arcsin(c*x)/(c^4*d^
3) + 2/3*b^2*log(2)/(c^4*d^3) + 1/3*b^2*log(abs(-c^2*x^2 + 1))/(c^4*d^3) -
1/4*a^2/(c^4*d^3) + 1/12*b^2/(c^4*d^3)
```

3.203 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=341

$$-\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3}+\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3}+\frac{b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right)}{4c^3d^3}$$

```
[Out] (b^2*x)/(12*c^2*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^3*d^3*(1
- c^2*x^2)^(3/2)) + (b*(a + b*ArcSin[c*x]))/(4*c^3*d^3*Sqrt[1 - c^2*x^2]) +
 (x*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c
*x])^2)/(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(
I*ArcSin[c*x])])/(c^3*d^3) - (b^2*ArcTanh[c*x])/(6*c^3*d^3) - ((I/4)*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3) + ((I/4)*b*(a
 + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3) + (b^2*PolyLog
[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^3*d^3) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*
x])])/(4*c^3*d^3)
```

Rubi [A] time = 0.421745, antiderivative size = 341, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.37, Rules used = {4703, 4655, 4657, 4181, 2531, 2282, 6589, 4677, 206, 199}

$$-\frac{ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3}+\frac{ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3}+\frac{b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}(cx)}\right)}{4c^3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```


```
[Out] (b^2*x)/(12*c^2*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^3*d^3*(1
- c^2*x^2)^(3/2)) + (b*(a + b*ArcSin[c*x]))/(4*c^3*d^3*Sqrt[1 - c^2*x^2]) +
 (x*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c
*x])^2)/(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(
I*ArcSin[c*x])])/(c^3*d^3) - (b^2*ArcTanh[c*x])/(6*c^3*d^3) - ((I/4)*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3) + ((I/4)*b*(a
 + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3) + (b^2*PolyLog
[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^3*d^3) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*
x])])/(4*c^3*d^3)
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
```

```
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2cd^3} - \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx}{4c^2d}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{8c^2d^3\left(1-c^2x^2\right)} + \frac{b^2\int \frac{1}{\left(1-c^2x^2\right)^2}\,dx}{6c^2d^3} +$$

$$= \frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x}{}$$

$$= \frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x}{}$$

$$= \frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x}{}$$

$$= \frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x}{}$$

$$= \frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b\left(a+b\sin^{-1}(cx)\right)}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x}{}$$

Mathematica [A] time = 4.37925, size = 446, normalized size = 1.31

$$\frac{-12iab\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+12iab\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+4b^2\left(-3i\sin^{-1}(cx)\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+3i\sin\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((12*a^2*c*x)/(-1 + c^2*x^2)^2 + (6*a^2*c*x)/(-1 + c^2*x^2) + (a*b*(-3 + Sq
rt[1 - c^2*x^2] - 4*Cos[2*ArcSin[c*x]] + 3*Cos[3*ArcSin[c*x]] - Cos[4*ArcSi
n[c*x]] + 12*ArcSin[c*x]*(c*x + c^3*x^3 - (-1 + c^2*x^2)^2*Log[1 - I*E^(I*A
rcSin[c*x])] + (-1 + c^2*x^2)^2*Log[1 + I*E^(I*ArcSin[c*x])])))/(-1 + c^2*x
^2)^2 + 3*a^2*Log[1 - c*x] - 3*a^2*Log[1 + c*x] - (12*I)*a*b*PolyLog[2, (-I
)*E^(I*ArcSin[c*x])] + (12*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] + 4*b^2*(
(3*I)*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] - 2*ArcTanh[c*x] - (3*I)*ArcS
in[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (3*I)*ArcSin[c*x]*PolyLog[2, I
*E^(I*ArcSin[c*x])] + 3*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 3*PolyLog[3, I
*E^(I*ArcSin[c*x])]) + (b^2*(2*ArcSin[c*x]*(Sqrt[1 - c^2*x^2] + 3*Cos[3*Arc
Sin[c*x]]) - 3*ArcSin[c*x]^2*(-7*c*x + Sin[3*ArcSin[c*x]]) + 2*(c*x + Sin[3
*ArcSin[c*x]])))/(2*(-1 + c^2*x^2)^2))/(48*c^3*d^3)
```

Maple [B] time = 0.437, size = 894, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/4*I/c^3*b^2/d^3*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/4*I
/c^3*a*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/4*I/c^3*a*b/d^3*dilog(
1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/8/c^3*b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))+1/3*I/c^3*b^2/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+1/
8/c^2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x+1/12/c^3*b^2/d^3/(c^4*x
^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/12/c^3*a*b/d^3/(c^4*x^4-2*
c^2*x^2+1)*(-c^2*x^2+1)^(1/2)+1/4/c^3*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c
^2*x^2+1)^(1/2)))-1/4/c^3*a*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))+1/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x^3-1/4*I/c^3*b^2/d^3*a
rcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/12/c^2*b^2/d^3/(c^4*x
^4-2*c^2*x^2+1)*x+1/16/c^3*a^2/d^3/(c*x-1)^2+1/16/c^3*a^2/d^3/(c*x-1)-1/16/
c^3*a^2/d^3/(c*x+1)^2+1/16/c^3*a^2/d^3/(c*x+1)+1/16/c^3*a^2/d^3*ln(c*x-1)-1
/16/c^3*a^2/d^3*ln(c*x+1)-1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*x^3+1/8*b^2/d^
3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x^3+1/8/c^3*b^2/d^3*arcsin(c*x)^2*ln(
1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/4*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))/c^3/d^3-1/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^3-1/4/c
*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2-1/4/c*a*b
/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*(-c^2*x^2+1)^(1/2)+1/4/c^2*a*b/d^3/(c^4*x^4-
2*c^2*x^2+1)*arcsin(c*x)*x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{16}a^2\left(\frac{2\left(c^2x^3+x\right)}{c^6d^3x^4-2\,c^4d^3x^2+c^2d^3}-\frac{\log\left(cx+1\right)}{c^3d^3}+\frac{\log\left(cx-1\right)}{c^3d^3}\right)-\frac{\left(b^2c^4x^4-2\,b^2c^2x^2+b^2\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a^2*(2*(c^2*x^3 + x)/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) - log(c*x
 + 1)/(c^3*d^3) + log(c*x - 1)/(c^3*d^3)) - 1/16*((b^2*c^4*x^4 - 2*b^2*c^2*
x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - (b^2
*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^
2*log(-c*x + 1) - 2*(b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2 + 16*(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)*integrate(1/8*(1
6*a*b*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + ((b^2*c^4*x^4 -
2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1
) - (b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))*log(-c*x + 1) - 2*(b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^8*d^3*x^6 - 3*c^6*d^3*x
^4 + 3*c^4*d^3*x^2 - c^2*d^3), x))/(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2x^2\arcsin\left(cx\right)^2+2\,abx^2\arcsin\left(cx\right)+a^2x^2}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^6*d^
3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a^2x^2}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{2abx^2\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**2*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**2*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx)+a)^2x^2}{(c^2dx^2-d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d)^3, x)
```

3.204 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=150

$$-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^3\sqrt{1-c^2x^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}+\frac{b^2}{12c^2d^3\left(1-c^2x^2\right)}-\frac{b^2\log\left(1-c^2x^2\right)}{6c^2d^3}$$

```
[Out] b^2/(12*c^2*d^3*(1 - c^2*x^2)) - (b*x*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^
2*x^2)^(3/2)) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^3*Sqrt[1 - c^2*x^2]) + (a
+ b*ArcSin[c*x])^2/(4*c^2*d^3*(1 - c^2*x^2)^2) - (b^2*Log[1 - c^2*x^2])/(6*
c^2*d^3)
```

Rubi [A] time = 0.137028, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4677, 4655, 4651, 260, 261}

$$-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^3\sqrt{1-c^2x^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2}+\frac{b^2}{12c^2d^3\left(1-c^2x^2\right)}-\frac{b^2\log\left(1-c^2x^2\right)}{6c^2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] b^2/(12*c^2*d^3*(1 - c^2*x^2)) - (b*x*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^
2*x^2)^(3/2)) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^3*Sqrt[1 - c^2*x^2]) + (a
+ b*ArcSin[c*x])^2/(4*c^2*d^3*(1 - c^2*x^2)^2) - (b^2*Log[1 - c^2*x^2])/(6*
c^2*d^3)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
```

```
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2cd^3}$$

$$= -\frac{bx\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} + \frac{b^2\int \frac{x}{\left(1-c^2x^2\right)^2}\,dx}{6d^3} - \frac{b\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{3cd^3}$$

$$= \frac{b^2}{12c^2d^3\left(1-c^2x^2\right)} - \frac{bx\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} + \frac{b^2}{\ldots}$$

$$= \frac{b^2}{12c^2d^3\left(1-c^2x^2\right)} - \frac{bx\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b^2}{\ldots}$$

Mathematica [A] time = 0.197349, size = 162, normalized size = 1.08

$$\frac{3a^2+4abc^3x^3\sqrt{1-c^2x^2}-6abcx\sqrt{1-c^2x^2}+2b\sin^{-1}(cx)\left(3a+bcx\sqrt{1-c^2x^2}\left(2c^2x^2-3\right)\right)-b^2c^2x^2-2b^2\left(c^2x^2-1\right)^2 \ldots}{12c^2d^3\left(c^2x^2-1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (3*a^2 + b^2 - b^2*c^2*x^2 - 6*a*b*c*x*Sqrt[1 - c^2*x^2] + 4*a*b*c^3*x^3*Sq
rt[1 - c^2*x^2] + 2*b*(3*a + b*c*x*Sqrt[1 - c^2*x^2]*(-3 + 2*c^2*x^2))*ArcS
in[c*x] + 3*b^2*ArcSin[c*x]^2 - 2*b^2*(-1 + c^2*x^2)^2*Log[1 - c^2*x^2])/(1
2*c^2*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] time = 0.036, size = 335, normalized size = 2.2

$$\frac{a^2}{4\,c^2d^3\left(c^2x^2-1\right)^2} + \frac{b^2\left(\arcsin(cx)\right)^2}{4\,c^2d^3\left(c^2x^2-1\right)^2} - \frac{b^2\arcsin(cx)\,x}{6\,cd^3\left(c^2x^2-1\right)^2}\sqrt{-c^2x^2+1} - \frac{b^2}{12\,c^2d^3\left(c^2x^2-1\right)} + \frac{b^2\arcsin(cx)\,x}{3\,cd^3\left(c^2x^2-1\right)}\sqrt{-c^2x^2 \ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/4/c^2*a^2/d^3/(c^2*x^2-1)^2+1/4/c^2*b^2/d^3*arcsin(c*x)^2/(c^2*x^2-1)^2-1
/6/c*b^2/d^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)^2*x-1/12/c^2*b^2/d^
3/(c^2*x^2-1)+1/3/c*b^2/d^3*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x-1/
6*b^2*ln(-c^2*x^2+1)/c^2/d^3+1/2/c^2*a*b/d^3/(c^2*x^2-1)^2*arcsin(c*x)+1/6/
c^2*a*b/d^3/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/6/c^2*a*b/d^3/(c*x+1)*(-(c
*x+1)^2+2*c*x+2)^(1/2)-1/24/c^2*a*b/d^3/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2
)+1/24/c^2*a*b/d^3/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2}{4\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}+\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2-2\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)\int\frac{4\,abcx\arctan\left(cx,\sqrt{cx+1}\sqrt{-c}\right.}{c^7d^3}}{4\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^2/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) + 1/4*(b^2*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)*in
tegrate(-1/2*(4*a*b*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - sqrt(c
*x + 1)*sqrt(-c*x + 1)*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^7
*d^3*x^6 - 3*c^5*d^3*x^4 + 3*c^3*d^3*x^2 - c*d^3), x))/(c^6*d^3*x^4 - 2*c^4
*d^3*x^2 + c^2*d^3)
```

Fricas [A] time = 2.71602, size = 360, normalized size = 2.4

$$-\frac{b^2c^2x^2-3\,b^2\arcsin\left(cx\right)^2-6\,ab\arcsin\left(cx\right)-3\,a^2-b^2+2\left(b^2c^4x^4-2\,b^2c^2x^2+b^2\right)\log\left(c^2x^2-1\right)-2\left(2\,abc^3x^3-3\,abc\right.}{12\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] -1/12*(b^2*c^2*x^2 - 3*b^2*arcsin(c*x)^2 - 6*a*b*arcsin(c*x) - 3*a^2 - b^2
+ 2*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*log(c^2*x^2 - 1) - 2*(2*a*b*c^3*x^3
 - 3*a*b*c*x + (2*b^2*c^3*x^3 - 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))
/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int\frac{a^2x}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{b^2x\operatorname{asin}^2\left(cx\right)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{2abx\operatorname{asin}\left(cx\right)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b**2*x*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Int
egral(2*a*b*x*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d*
```

*3

Giac [B] time = 1.46452, size = 533, normalized size = 3.55

$$\frac{b^2c^2x^4\arcsin(cx)^2}{4\left(c^2x^2-1\right)^2d^3}+\frac{abc^2x^4\arcsin(cx)}{2\left(c^2x^2-1\right)^2d^3}+\frac{a^2c^2x^4}{4\left(c^2x^2-1\right)^2d^3}+\frac{b^2cx^3\arcsin(cx)}{6\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}d^3}-\frac{b^2x^2\arcsin(cx)^2}{2\left(c^2x^2-1\right)d^3}+\frac{}{6\left(c^2x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b^2*c^2*x^4*arcsin(c*x)^2/((c^2*x^2 - 1)^2*d^3) + 1/2*a*b*c^2*x^4*arcsi
n(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a^2*c^2*x^4/((c^2*x^2 - 1)^2*d^3) + 1/6*
b^2*c*x^3*arcsin(c*x)/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*d^3) - 1/2*b^2*x^2*
arcsin(c*x)^2/((c^2*x^2 - 1)*d^3) + 1/6*a*b*c*x^3/((c^2*x^2 - 1)*sqrt(-c^2*
x^2 + 1)*d^3) - a*b*x^2*arcsin(c*x)/((c^2*x^2 - 1)*d^3) - 1/2*a^2*x^2/((c^2
*x^2 - 1)*d^3) - 1/12*b^2*x^2/((c^2*x^2 - 1)*d^3) - 1/2*b^2*x*arcsin(c*x)/(
sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b^2*arcsin(c*x)^2/(c^2*d^3) - 1/2*a*b*x/(sq
rt(-c^2*x^2 + 1)*c*d^3) + 1/2*a*b*arcsin(c*x)/(c^2*d^3) - 1/3*b^2*log(2)/(c
^2*d^3) - 1/6*b^2*log(abs(-c^2*x^2 + 1))/(c^2*d^3) + 1/4*a^2/(c^2*d^3) + 1/
12*b^2/(c^2*d^3)
```

3.205 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=332

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4cd^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4cd^3}-\frac{3b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}\right.}}{4cd^3}$$

```
[Out] (b^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^2*
x^2)^(3/2)) - (3*b*(a + b*ArcSin[c*x]))/(4*c*d^3*Sqrt[1 - c^2*x^2]) + (x*(a
 + b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x])^2)/
(8*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin
[c*x])])/(c*d^3) + (5*b^2*ArcTanh[c*x])/(6*c*d^3) + (((3*I)/4)*b*(a + b*Arc
Sin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) - (((3*I)/4)*b*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3) - (3*b^2*PolyLog[3,
(-I)*E^(I*ArcSin[c*x])])/(4*c*d^3) + (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])]
)/(4*c*d^3)
```

Rubi [A] time = 0.350826, antiderivative size = 332, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4655, 4657, 4181, 2531, 2282, 6589, 4677, 206, 199}

$$\frac{3ib\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4cd^3}-\frac{3ib\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4cd^3}-\frac{3b^2\text{PolyLog}\left(3,-ie^{i\sin^{-1}\right.}}{4cd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^3,x]
```


```
[Out] (b^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^2*
x^2)^(3/2)) - (3*b*(a + b*ArcSin[c*x]))/(4*c*d^3*Sqrt[1 - c^2*x^2]) + (x*(a
 + b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x])^2)/
(8*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin
[c*x])])/(c*d^3) + (5*b^2*ArcTanh[c*x])/(6*c*d^3) + (((3*I)/4)*b*(a + b*Arc
Sin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) - (((3*I)/4)*b*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3) - (3*b^2*PolyLog[3,
(-I)*E^(I*ArcSin[c*x])])/(4*c*d^3) + (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])]
)/(4*c*d^3)
```


Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}dx}{2d^3} + \frac{3\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}dx}{4d}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+b\sin^{-1}(cx)\right)^2}{8d^3\left(1-c^2x^2\right)} + \frac{b^2\int \frac{1}{\left(1-c^2x^2\right)^2}dx}{6d^3} - \frac{(3bc)\cdots}{\cdots}$$

$$= \frac{b^2x}{12d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b\left(a+b\sin^{-1}(cx)\right)}{4cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+\cdots\right.}{8d^3\left(\cdots\right.}$$

$$= \frac{b^2x}{12d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b\left(a+b\sin^{-1}(cx)\right)}{4cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+\cdots\right.}{8d^3\left(\cdots\right.}$$

$$= \frac{b^2x}{12d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b\left(a+b\sin^{-1}(cx)\right)}{4cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+\cdots\right.}{8d^3\left(\cdots\right.}$$

$$= \frac{b^2x}{12d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b\left(a+b\sin^{-1}(cx)\right)}{4cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+\cdots\right.}{8d^3\left(\cdots\right.}$$

$$= \frac{b^2x}{12d^3\left(1-c^2x^2\right)} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{6cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b\left(a+b\sin^{-1}(cx)\right)}{4cd^3\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x\left(a+\cdots\right.}{8d^3\left(\cdots\right.}$$

Mathematica [A] time = 5.80358, size = 556, normalized size = 1.67

$$\frac{ab\left(-72i\left(c^2x^2-1\right)^2 \text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)-70\sqrt{1-c^2x^2}+40\cos\left(2\sin^{-1}(cx)\right)-18\cos\left(3\sin^{-1}(cx)\right)+10\cos\left(4\sin^{-1}(cx)\right)+3\sin^{-1}(cx)\left(22cx+6\sin\left(3\sin^{-1}(cx)\right)+9\,\text{lo}\cdots\right.\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((24*a^2*x)/(-1 + c^2*x^2)^2 - (36*a^2*x)/(-1 + c^2*x^2) - (18*a^2*Log[1 -
c*x])/c + (18*a^2*Log[1 + c*x])/c + ((72*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin
[c*x])])/c - (4*b^2*((2*c*x)/(-1 + c^2*x^2) + (4*ArcSin[c*x])/(1 - c^2*x^2)
^(3/2) + (18*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (6*c*x*ArcSin[c*x]^2)/(-1 + c
^2*x^2)^2 + (9*c*x*ArcSin[c*x]^2)/(-1 + c^2*x^2) + (18*I)*ArcSin[c*x]^2*Arc
Tan[E^(I*ArcSin[c*x])] - 20*ArcTanh[c*x] - (18*I)*ArcSin[c*x]*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])] + (18*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])]
+ 18*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 18*PolyLog[3, I*E^(I*ArcSin[c*x])
]))/c + (a*b*(30 - 70*Sqrt[1 - c^2*x^2] + 40*Cos[2*ArcSin[c*x]] - 18*Cos[3*
ArcSin[c*x]] + 10*Cos[4*ArcSin[c*x]] - (72*I)*(-1 + c^2*x^2)^2*PolyLog[2, I
*E^(I*ArcSin[c*x])] + 3*ArcSin[c*x]*(22*c*x + 9*Log[1 - I*E^(I*ArcSin[c*x])
] + 12*Cos[2*ArcSin[c*x]]*(Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 + I*E^(I*Ar
cSin[c*x])]) + 3*Cos[4*ArcSin[c*x]]*(Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 +
 I*E^(I*ArcSin[c*x])]) - 9*Log[1 + I*E^(I*ArcSin[c*x])] + 6*Sin[3*ArcSin[c*
x]])))/(c*(-1 + c^2*x^2)^2))/(96*d^3)
```

Maple [B] time = 0.233, size = 890, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] 1/16/c*a^2/d^3/(c*x-1)^2-3/16/c*a^2/d^3/(c*x-1)-1/16/c*a^2/d^3/(c*x+1)^2-3/
16/c*a^2/d^3/(c*x+1)-3/16/c*a^2/d^3*ln(c*x-1)+3/16/c*a^2/d^3*ln(c*x+1)+1/12
*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*x-3/8/c*b^2/d^3*arcsin(c*x)^2*ln(1+I*(I*c*x+
(-c^2*x^2+1)^(1/2)))+3/8/c*b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)
^(1/2)))+5/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x-5/3*I/c*b^2/d^3*
arctan(I*c*x+(-c^2*x^2+1)^(1/2))-1/12*c^2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*x^3
-3/4*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^3+3/4*b^2*polylog(3,I
*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^3+3/4*c*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*x^2-3/4*c^2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin
(c*x)*x^3+3/4*c*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*(-c^2*x^2+1)^(1/2)-3/4*I/
c*a*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I/c*b^2/d^3*arcsin(c*x)
*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/4*I/c*b^2/d^3*arcsin(c*x)*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I/c*a*b/d^3*dilog(1+I*(I*c*x+(-c^2*x
^2+1)^(1/2)))+5/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x-11/12/c*b^2/d
^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-11/12/c*a*b/d^3/(c^
4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-3/4/c*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c
*x+(-c^2*x^2+1)^(1/2)))+3/4/c*a*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2)))-3/8*c^2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{16}a^2\left(\frac{2\left(3c^2x^3-5x\right)}{c^4d^3x^4-2c^2d^3x^2+d^3}-\frac{3\log(cx+1)}{cd^3}+\frac{3\log(cx-1)}{cd^3}\right)+\frac{3\left(b^2c^4x^4-2b^2c^2x^2+b^2\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a^2*(2*(3*c^2*x^3 - 5*x)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) - 3*log(
c*x + 1)/(c*d^3) + 3*log(c*x - 1)/(c*d^3)) + 1/16*(3*(b^2*c^4*x^4 - 2*b^2*c
^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3
*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 5*b^2*c*x)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))^2 + 16*(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3)*integrate
(-1/8*(16*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (3*(b^2*c^4*x^4
- 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 5*b^2*c*x)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^6 - 3*c
^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x))/(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3
)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2}{c^6d^3x^6-3c^4d^3x^4+3c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^6 - 3*c^
4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)^2}{(c^2dx^2 - d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d)^3, x)
```

3.206 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=296

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}\right.}}{2d^3}$$

```
[Out] b^2/(12*d^3*(1 - c^2*x^2)) - (b*c*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^
2)^(3/2)) - (4*b*c*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (a +
b*ArcSin[c*x])^2/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])^2/(2*d^3*(1
- c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3
- (2*b^2*Log[1 - c^2*x^2])/(3*d^3) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E
^((2*I)*ArcSin[c*x])])/d^3 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*A
rcSin[c*x])])/d^3 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d^3) + (b^2
*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^3)
```

Rubi [A] time = 0.49134, antiderivative size = 296, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4705, 4679, 4419, 4183, 2531, 2282, 6589, 4651, 260, 4655, 261}

$$\frac{ib\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{ib\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{b^2\text{PolyLog}\left(3,-e^{2i\sin^{-1}\right.}}{2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^3),x]
```


```
[Out] b^2/(12*d^3*(1 - c^2*x^2)) - (b*c*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^
2)^(3/2)) - (4*b*c*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (a +
b*ArcSin[c*x])^2/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])^2/(2*d^3*(1
- c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3
- (2*b^2*Log[1 - c^2*x^2])/(3*d^3) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E
^((2*I)*ArcSin[c*x])])/d^3 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*A
rcSin[c*x])])/d^3 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d^3) + (b^2
*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^3)
```


Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
```

```
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

```
&& GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^3}dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{5/2}}dx}{2d^3} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^2}dx}{d}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^3\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}dx}{3d^3} -$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(a}{}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(a}{}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(a}{}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(a}{}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(a}{}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(a}{}$$

Mathematica [A] time = 3.68108, size = 459, normalized size = 1.55

$$-\frac{4ab\left(-6i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+6i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{8cx}{\sqrt{1-c^2x^2}}+\frac{cx}{\left(1-c^2x^2\right)^{3/2}}+\frac{6\sin^{-1}(cx)}{c^2x^2-1}-\frac{3\sin^{-1}(cx)}{\left(c^2x^2-1\right)^2}-12\sin}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] -((-6*a^2)/(-1 + c^2*x^2)^2 + (12*a^2)/(-1 + c^2*x^2) - 24*a^2*Log[c*x] + 1
2*a^2*Log[1 - c^2*x^2] + 4*a*b*((c*x)/(1 - c^2*x^2)^(3/2) + (8*c*x)/Sqrt[1
- c^2*x^2] - (3*ArcSin[c*x])/(-1 + c^2*x^2)^2 + (6*ArcSin[c*x])/(-1 + c^2*x
^2) - 12*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 12*ArcSin[c*x]*Log[1
+ E^((2*I)*ArcSin[c*x])] - (6*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + (6*I)
*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + b^2*(I*Pi^3 + 2/(-1 + c^2*x^2) + (4*c
*x*ArcSin[c*x])/(1 - c^2*x^2)^(3/2) + (32*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2
```

```
] - (6*ArcSin[c*x]^2)/(-1 + c^2*x^2)^2 + (12*ArcSin[c*x]^2)/(-1 + c^2*x^2)
- (16*I)*ArcSin[c*x]^3 - 24*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] +
 24*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] + 16*Log[1 - c^2*x^2] - (2
4*I)*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (24*I)*ArcSin[c*x]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])] - 12*PolyLog[3, E^((-2*I)*ArcSin[c*x])] +
12*PolyLog[3, -E^((2*I)*ArcSin[c*x])]))/(24*d^3)
```

Maple [B] time = 0.31, size = 1224, normalized size = 4.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x)
```

```
[Out] -1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-1/2*b^2/d^3/(c^4*x^4-
2*c^2*x^2+1)*arcsin(c*x)^2*c^2*x^2-3/2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c*x-4/3*I*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x
)*c^4*x^4+4/3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*
c^3*x^3+4/3*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3*(-c^2*x^2+1)^(1/2)-a*b/d^
3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^2*x^2-3/2*a*b/d^3/(c^4*x^4-2*c^2*x^2+
1)*c*x*(-c^2*x^2+1)^(1/2)-4/3*I*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^4*x^4+8/3*I
*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2+8/3*I*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*
arcsin(c*x)*c^2*x^2-2*I*b^2/d^3*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(
1/2))-2*I*b^2/d^3*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/12*b^2/
d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2+3/2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(
c*x)+2*a*b/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*a*b/d^3*arcsin(
c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*a*b/d^3*arcsin(c*x)*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))^2)+I*a*b/d^3*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4/3*I*
a*b/d^3/(c^4*x^4-2*c^2*x^2+1)-2*I*a*b/d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/
2))-2*I*a*b/d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+I*b^2/d^3*arcsin(c*x)*p
olylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4/3*I*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)
*arcsin(c*x)+3/4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2+b^2/d^3*arcsin
(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d^3*arcsin(c*x)^2*ln(1-I*c*x-(-c
^2*x^2+1)^(1/2))-b^2/d^3*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1
/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)+1/16*a^2/d^3/(c*x-1)^2-5/16*a^2/d^3/(c*x-
1)+1/16*a^2/d^3/(c*x+1)^2+5/16*a^2/d^3/(c*x+1)-1/2*a^2/d^3*ln(c*x-1)-1/2*a^
2/d^3*ln(c*x+1)-4/3*b^2/d^3*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+8/3*b^2/d^3*
ln(I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2/d^3*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))
+2*b^2/d^3*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+a^2/d^3*ln(c*x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a^2\left(\frac{2c^2x^2-3}{c^4d^3x^4-2c^2d^3x^2+d^3}+\frac{2\log(cx+1)}{d^3}+\frac{2\log(cx-1)}{d^3}-\frac{4\log(x)}{d^3}\right)-\int\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2}{c^6d^3x^7-3c^4d^3x^5+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*((2*c^2*x^2 - 3)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) + 2*log(c*x +
 1)/d^3 + 2*log(c*x - 1)/d^3 - 4*log(x)/d^3) - integrate((b^2*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
```

```
x + 1)))/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2 \arcsin(cx)^2 + 2\,ab \arcsin(cx) + a^2}{c^6 d^3 x^7 - 3\,c^4 d^3 x^5 + 3\,c^2 d^3 x^3 - d^3 x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^7 - 3*c^
4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)^2}{(c^2 dx^2 - d)^3 x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x), x)
```

3.207 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=429

$$\frac{15ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}-\frac{15ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}+\frac{2ib^2c\text{PolyLog}\left(2,-e\right.}{d^3}$$

```
[Out] (b^2*c^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(6*d^3*(1 -
c^2*x^2)^(3/2)) - (7*b*c*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) - (
a + b*ArcSin[c*x])^2/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x])
^2)/(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 -
c^2*x^2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/
d^3 - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^3 + (11*b^2*
c*ArcTanh[c*x])/(6*d^3) + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3
+ (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d
^3 - (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
^3 - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (15*b^2*c*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(4*d^3) + (15*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x]
)])/(4*d^3)
```

Rubi [A] time = 0.759348, antiderivative size = 429, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4701, 4655, 4657, 4181, 2531, 2282, 6589, 4677, 206, 199, 4705, 4709, 4183, 2279, 2391}

$$\frac{15ibc\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}-\frac{15ibc\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}+\frac{2ib^2c\text{PolyLog}\left(2,-e\right.}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] (b^2*c^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(6*d^3*(1 -
c^2*x^2)^(3/2)) - (7*b*c*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) - (
a + b*ArcSin[c*x])^2/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x])
^2)/(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 -
c^2*x^2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/
d^3 - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^3 + (11*b^2*
c*ArcTanh[c*x])/(6*d^3) + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3
+ (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d
^3 - (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
^3 - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (15*b^2*c*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(4*d^3) + (15*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x]
)])/(4*d^3)
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
```

```
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^3}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \left(5c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x\left(1-c^2x^2\right)^{5/2}}\,dx}{d^3}$$

$$= \frac{2bc\left(a+b\sin^{-1}(cx)\right)}{3d^3\left(1-c^2x^2\right)^{3/2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x\left(1-c^2x^2\right)^{3/2}}\,d}{d^3}$$

$$= -\frac{b^2c^2x}{3d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} + \frac{2bc\left(a+b\sin^{-1}(cx)\right)}{d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x}{}$$

$$= \frac{b^2c^2x}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{7bc\left(a+b\sin^{-1}(cx)\right)}{4d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x}{4}$$

$$= \frac{b^2c^2x}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{7bc\left(a+b\sin^{-1}(cx)\right)}{4d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x}{4}$$

$$= \frac{b^2c^2x}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{7bc\left(a+b\sin^{-1}(cx)\right)}{4d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x}{4}$$

$$= \frac{b^2c^2x}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{7bc\left(a+b\sin^{-1}(cx)\right)}{4d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x}{4}$$

$$= \frac{b^2c^2x}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{7bc\left(a+b\sin^{-1}(cx)\right)}{4d^3\sqrt{1-c^2x^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x}{4}$$

Mathematica [B] time = 11.5663, size = 1351, normalized size = 3.15

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -(a^2/(d^3*x)) + (a^2*c^2*x)/(4*d^3*(-1 + c^2*x^2)^2) - (7*a^2*c^2*x)/(8*d^
3*(-1 + c^2*x^2)) - (15*a^2*c*Log[1 - c*x])/(16*d^3) + (15*a^2*c*Log[1 + c*
x])/(16*d^3) - (b^2*c*((-2*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (44*ArcSin[c
*x] + 15*ArcSin[c*x]^3 - 45*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] - 45
*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I/2)*ArcS
in[c*x]))] + 45*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 45*ArcSin[c*x]
^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] - 45*P
i*ArcSin[c*x]*Log[-((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/(2*E^((I/2)*ArcSin
[c*x]))] - 45*ArcSin[c*x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^
((I/2)*ArcSin[c*x]))] + 45*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
 + 44*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 45*ArcSin[c*x]^2*Log[C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 44*Log[Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2]] + 45*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]] + 45*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (90*I)*ArcSin[c*
x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (90*I)*ArcSin[c*x]*PolyLog[2, I*E^(
I*ArcSin[c*x])] + 90*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 90*PolyLog[3, I*E
^(I*ArcSin[c*x])])/24 - (4 + 88*c*x*ArcSin[c*x] - 54*ArcSin[c*x]^2 + 30*c*x
*ArcSin[c*x]^3 - 240*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 4*Cos[4*ArcSin[c*x]
] - 90*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 96*c*x*ArcSin[c*x]*Log[1 - E^(I*A
```

```
rcSin[c*x])] - 96*c*x*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (768*I)*c*x*
(1 - c^2*x^2)^2*PolyLog[2, E^(I*ArcSin[c*x])] - 200*ArcSin[c*x]*Sin[2*ArcSi
n[c*x]] + 132*ArcSin[c*x]*Sin[3*ArcSin[c*x]] + 45*ArcSin[c*x]^3*Sin[3*ArcSi
n[c*x]] + 144*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] - 1
44*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] - 84*ArcSin[c*
x]*Sin[4*ArcSin[c*x]] + 44*ArcSin[c*x]*Sin[5*ArcSin[c*x]] + 15*ArcSin[c*x]^
3*Sin[5*ArcSin[c*x]] + 48*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[5*ArcS
in[c*x]] - 48*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]])/(3
84*c*x*(1 - c^2*x^2)^2)))/d^3 - (a*b*c*(24*ArcSin[c*x]*Cot[ArcSin[c*x]/2] -
 90*ArcSin[c*x]*(Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])
]) + 48*Log[Cos[ArcSin[c*x]/2]] - 48*Log[Sin[ArcSin[c*x]/2]] - (90*I)*(Poly
Log[2, (-I)*E^(I*ArcSin[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])]) - (3*ArcS
in[c*x])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4 - (-1 + 21*ArcSin[c*x]
)/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2 + (2*Sin[ArcSin[c*x]/2])/(Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (44*Sin[ArcSin[c*x]/2])/(Cos[ArcS
in[c*x]/2] - Sin[ArcSin[c*x]/2]) + (3*ArcSin[c*x])/(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2])^4 - (2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcS
in[c*x]/2])^3 + (1 + 21*ArcSin[c*x])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2])^2 - (44*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) +
 24*ArcSin[c*x]*Tan[ArcSin[c*x]/2]))/(24*d^3)
```

Maple [B] time = 0.392, size = 1093, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] -15/4*I*c*b^2/d^3*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/4*
I*c*a*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-15/4*I*c*a*b/d^3*dilog(1-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))+25/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x
)^2*c^2*x-15/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^4*x^3-23/12*c*
b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-23/12*c*a*b/d^
3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-15/4*c*a*b/d^3*arcsin(c*x)*ln(1+
I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/4*c*a*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^
2*x^2+1)^(1/2)))-2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)/x*arcsin(c*x)+15/4*I*c*b^2
/d^3*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/12*b^2/d^3/(c^4
*x^4-2*c^2*x^2+1)*c^2*x-1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c^4*x^3+2*c*a*b/
d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/x*arcsin(c
*x)^2-2*c*a*b/d^3*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*c*b^2/d^3*arcsin(c*x)*ln
(1+I*c*x+(-c^2*x^2+1)^(1/2))-15/8*c*b^2/d^3*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c
^2*x^2+1)^(1/2)))+15/8*c*b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))+2*I*c*b^2/d^3*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*c*b^2/d^3*dilog(1+
I*c*x+(-c^2*x^2+1)^(1/2))-11/3*I*c*b^2/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2))
+1/16*c*a^2/d^3/(c*x-1)^2-7/16*c*a^2/d^3/(c*x-1)-1/16*c*a^2/d^3/(c*x+1)^2-7
/16*c*a^2/d^3/(c*x+1)-15/16*c*a^2/d^3*ln(c*x-1)+15/16*c*a^2/d^3*ln(c*x+1)+7
/4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^2-15/
4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^4*x^3+7/4*a*b/d^3/(c^4*x^4-2*
c^2*x^2+1)*c^3*x^2*(-c^2*x^2+1)^(1/2)+25/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*ar
csin(c*x)*c^2*x-a^2/d^3/x-15/4*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))/d^3+15/4*b^2*c*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{16}a^2\left(\frac{2\left(15\,c^4x^4-25\,c^2x^2+8\right)}{c^4d^3x^5-2\,c^2d^3x^3+d^3x}-\frac{15\,c\log\left(cx+1\right)}{d^3}+\frac{15\,c\log\left(cx-1\right)}{d^3}\right)+\frac{15\left(b^2c^5x^5-2\,b^2c^3x^3+b^2cx\right)\arctan\left(cx,\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a^2*(2*(15*c^4*x^4 - 25*c^2*x^2 + 8)/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d
^3*x) - 15*c*log(c*x + 1)/d^3 + 15*c*log(c*x - 1)/d^3) + 1/16*(15*(b^2*c^5*
x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
*log(c*x + 1) - 15*(b^2*c^5*x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(15*b^2*c^4*x^4 - 25*b^2*c^2
*x^2 + 8*b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 16*(c^4*d^3*x^
5 - 2*c^2*d^3*x^3 + d^3*x)*integrate(-1/8*(16*a*b*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) - (15*(b^2*c^6*x^6 - 2*b^2*c^4*x^4 + b^2*c^2*x^2)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(b^2*c^6*x^6 - 2*b^2*
c^4*x^4 + b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x
+ 1) - 2*(15*b^2*c^5*x^5 - 25*b^2*c^3*x^3 + 8*b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^8 - 3*c^4*
d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x))/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2}{c^6d^3x^8-3\,c^4d^3x^6+3\,c^2d^3x^4-d^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^8 - 3*c^
4*d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

3.208 $\int \frac{(a+b\sin^{-1}(cx))^2}{x^3(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=403

$$\frac{3ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{3ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{3b^2c^2\text{PolyLog}(3}{2d^3}$$

```
[Out] (b^2*c^2)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(d^3*x*(1 - c^
2*x^2)^(3/2)) + (5*b*c^3*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2))
 - (4*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a +
b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])^2/(2*d^3*x^
2*(1 - c^2*x^2)^2) + (3*c^2*(a + b*ArcSin[c*x])^2)/(2*d^3*(1 - c^2*x^2)) -
(6*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (b^2*c^2
*Log[x])/d^3 - (7*b^2*c^2*Log[1 - c^2*x^2])/(6*d^3) + ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^3 - (3*b^2*c^2*PolyLog[3,
-E^((2*I)*ArcSin[c*x])])/(2*d^3) + (3*b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*
x])])/(2*d^3)
```

Rubi [A] time = 0.784098, antiderivative size = 403, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 19, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.704, Rules used = {4701, 4705, 4679, 4419, 4183, 2531, 2282, 6589, 4651, 260, 4655, 261, 271, 192, 191, 4689, 12, 1251, 893}

$$\frac{3ibc^2\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{3ibc^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^3}-\frac{3b^2c^2\text{PolyLog}(3}{2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^3),x]
```


```
[Out] (b^2*c^2)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(d^3*x*(1 - c^
2*x^2)^(3/2)) + (5*b*c^3*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2))
 - (4*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a +
b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])^2/(2*d^3*x^
2*(1 - c^2*x^2)^2) + (3*c^2*(a + b*ArcSin[c*x])^2)/(2*d^3*(1 - c^2*x^2)) -
(6*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (b^2*c^2
*Log[x])/d^3 - (7*b^2*c^2*Log[1 - c^2*x^2])/(6*d^3) + ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^3 - (3*b^2*c^2*PolyLog[3,
-E^((2*I)*ArcSin[c*x])])/(2*d^3) + (3*b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*
x])])/(2*d^3)
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
```

```
0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
```

```
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4689

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(1 - c^2*x^2)^p, x]}, Dist[d^p*(a + b*
ArcSin[c*x]), u, x] - Dist[b*c*d^p, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^
2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && Intege
rQ[p - 1/2] && (IGtQ[(m + 1)/2, 0] || ILtQ[(m + 2*p + 3)/2, 0]) && NeQ[p, -
2^(-1)] && GtQ[d, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^3}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^3x^2\left(1-c^2x^2\right)^2} + \left(3c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^3}\,dx + \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(1-c^2x^2\right)^{5/2}}\,dx}{d^3}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{4bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{8bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2\left(a+b\sin^{-1}(c\ldots\right.}{4d^3\left(1-c^2x^2\right.\ldots}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} + \frac{8bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2\left(a+b\sin^{-1}(c\ldots\right.}{4d^3\left(1-c^2x^2\right.\ldots}$$

$$= \frac{b^2c^2}{4d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \ldots$$

$$= \frac{b^2c^2}{4d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \ldots$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \ldots$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \ldots$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \ldots$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^3\sqrt{1-c^2x^2}} + \ldots$$

Mathematica [A] time = 6.61326, size = 569, normalized size = 1.41

$$-\frac{2abc^2\left(-18i\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+18i\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{14cx}{\sqrt{1-c^2x^2}}+\frac{cx}{\left(1-c^2x^2\right)^{3/2}}+\frac{6\sqrt{1-c^2x^2}}{cx}+\frac{12\sin^{-1}(cx)}{c^2x^2-1}-\frac{3\sin\ldots}{\left(c^2x\ldots\right.}\ldots\right.}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] -((6*a^2)/x^2 - (3*a^2*c^2)/(-1 + c^2*x^2)^2 + (12*a^2*c^2)/(-1 + c^2*x^2)
- 36*a^2*c^2*Log[x] + 18*a^2*c^2*Log[1 - c^2*x^2] + 2*a*b*c^2*((c*x)/(1 - c
^2*x^2)^(3/2) + (14*c*x)/Sqrt[1 - c^2*x^2] + (6*Sqrt[1 - c^2*x^2])/(c*x) +
(6*ArcSin[c*x])/(c^2*x^2) - (3*ArcSin[c*x])/(-1 + c^2*x^2)^2 + (12*ArcSin[c
*x])/(-1 + c^2*x^2) - 36*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 36*Ar
cSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - (18*I)*PolyLog[2, -E^((2*I)*ArcS
in[c*x])] + (18*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 12*b^2*c^2*((-3*I)*
ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (3*I)*ArcSin[c*x]*PolyLog[
2, -E^((2*I)*ArcSin[c*x])] + ((3*I)*Pi^3 + 2/(-1 + c^2*x^2) + (4*c*x*ArcSin
[c*x])/(1 - c^2*x^2)^(3/2) + (56*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + (24*S
qrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + (12*ArcSin[c*x]^2)/(c^2*x^2) - (6*Arc
Sin[c*x]^2)/(-1 + c^2*x^2)^2 + (24*ArcSin[c*x]^2)/(-1 + c^2*x^2) - (48*I)*A
rcSin[c*x]^3 - 72*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 72*ArcSin
[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - 24*Log[c*x] + 28*Log[1 - c^2*x^2]
- 36*PolyLog[3, E^((-2*I)*ArcSin[c*x])] + 36*PolyLog[3, -E^((2*I)*ArcSin[c*
x])])/24))/(12*d^3)
```

Maple [B] time = 0.396, size = 1547, normalized size = 3.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x)
```

```
[Out] -1/12*c^4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2+1/12*c^2*b^2/d^3/(c^4*x^4-2*c^2
*x^2+1)+1/16*c^2*a^2/d^3/(c*x-1)^2-9/16*c^2*a^2/d^3/(c*x-1)+1/16*c^2*a^2/d^
3/(c*x+1)^2+9/16*c^2*a^2/d^3/(c*x+1)-3/2*c^2*a^2/d^3*ln(c*x-1)-3/2*c^2*a^2/
d^3*ln(c*x+1)-7/3*c^2*b^2/d^3*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+8/3*c^2*b^
2/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2))+6*c^2*b^2/d^3*polylog(3,-I*c*x-(-c^2*x^2
+1)^(1/2))+6*c^2*b^2/d^3*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+3*c^2*a^2/d^3*
ln(c*x)+c^2*b^2/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+c^2*b^2/d^3*ln(1+I*c*x+(
-c^2*x^2+1)^(1/2))-1/2*a^2/d^3/x^2-3/2*b^2*c^2*polylog(3,-(I*c*x+(-c^2*x^2+
1)^(1/2))^2)/d^3+3*I*c^2*b^2/d^3*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)
^(1/2))^2)-4/3*I*c^2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)-6*I*c^2*a*b/
d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-4/3*I*c^2*a*b/d^3/(c^4*x^4-2*c^2*x^
2+1)-6*I*c^2*b^2/d^3*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-6*I*c
^2*b^2/d^3*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+6*c^2*a*b/d^3*ar
csin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+6*c^2*a*b/d^3*arcsin(c*x)*ln(1-I*c
*x-(-c^2*x^2+1)^(1/2))-6*c^2*a*b/d^3*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(
1/2))^2)-a*b/d^3/(c^4*x^4-2*c^2*x^2+1)/x^2*arcsin(c*x)+3*I*c^2*a*b/d^3*poly
log(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-6*I*c^2*a*b/d^3*polylog(2,-I*c*x-(-c^2
*x^2+1)^(1/2))-3/2*c^4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x^2+9/2*
c^2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)-c*b^2/d^3/(c^4*x^4-2*c^2*x^2+
1)/x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-c*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)/x*(-c^2
*x^2+1)^(1/2)-1/2*c^3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*x+4/3*c^5*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*x^3+4/3*c^5*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^3*(-c^2*x^2+1)^(1/2)-3*c^4*
a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x^2-1/2*c^3*a*b/d^3/(c^4*x^4-2*c^
2*x^2+1)*x*(-c^2*x^2+1)^(1/2)-4/3*I*c^6*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsi
n(c*x)*x^4-4/3*I*c^6*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^4+8/3*I*c^4*a*b/d^3/(c
^4*x^4-2*c^2*x^2+1)*x^2+8/3*I*c^4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)
*x^2+3*c^2*b^2/d^3*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-3*c^2*b^2/d
^3*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2/d^3/(c^4*x^4-2*
c^2*x^2+1)/x^2*arcsin(c*x)^2+9/4*c^2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c
```

```
*x)^2+3*c^2*b^2/d^3*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a^2\left(\frac{6c^4x^4-9c^2x^2+2}{c^4d^3x^6-2c^2d^3x^4+d^3x^2}+\frac{6c^2\log(cx+1)}{d^3}+\frac{6c^2\log(cx-1)}{d^3}-\frac{12c^2\log(x)}{d^3}\right)-\int\frac{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx}\right.}{c^6d^3x^9-3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*((6*c^4*x^4 - 9*c^2*x^2 + 2)/(c^4*d^3*x^6 - 2*c^2*d^3*x^4 + d^3*x^
2) + 6*c^2*log(c*x + 1)/d^3 + 6*c^2*log(c*x - 1)/d^3 - 12*c^2*log(x)/d^3) -
 integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*
d^3*x^5 - d^3*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2}{c^6d^3x^9-3c^4d^3x^7+3c^2d^3x^5-d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^9 - 3*c^
4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int-\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x^3), x)
```

3.209 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=572

$$\frac{35ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}-\frac{35ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}+\frac{19ib^2c^3\text{PolyLo}}{3}$$

```
[Out] -(b^2*c^2)/(2*d^3*x) + (b^2*c^2)/(6*d^3*x*(1 - c^2*x^2)) - (b^2*c^4*x)/(12*
d^3*(1 - c^2*x^2)) + (b*c^3*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2)
) - (b*c*(a + b*ArcSin[c*x]))/(3*d^3*x^2*(1 - c^2*x^2)^(3/2)) - (29*b*c^3*(
a + b*ArcSin[c*x]))/(12*d^3*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])^2/(3*d
^3*x^3*(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x])^2)/(3*d^3*x*(1 - c^2*x
^2)^2) + (35*c^4*x*(a + b*ArcSin[c*x])^2)/(12*d^3*(1 - c^2*x^2)^2) + (35*c^
4*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b*A
rcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^3 - (38*b*c^3*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^3) + (17*b^2*c^3*ArcTanh[c*x])/(6*d^3) +
 (((19*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3 + (((35*I)/4)*b*c^
3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - (((35*I)/4)
*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3 - (((19*I)/
3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (35*b^2*c^3*PolyLog[3, (-I)
*E^(I*ArcSin[c*x])])/(4*d^3) + (35*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])])
/(4*d^3)
```

Rubi [A] time = 1.32127, antiderivative size = 572, normalized size of antiderivative = 1., number of steps used = 43, number of rules used = 17, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.63, Rules used = {4701, 4655, 4657, 4181, 2531, 2282, 6589, 4677, 206, 199, 4705, 4709, 4183, 2279, 2391, 290, 325}

$$\frac{35ibc^3\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}-\frac{35ibc^3\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{4d^3}+\frac{19ib^2c^3\text{PolyLo}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^3),x]
```


```
[Out] -(b^2*c^2)/(2*d^3*x) + (b^2*c^2)/(6*d^3*x*(1 - c^2*x^2)) - (b^2*c^4*x)/(12*
d^3*(1 - c^2*x^2)) + (b*c^3*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2)
) - (b*c*(a + b*ArcSin[c*x]))/(3*d^3*x^2*(1 - c^2*x^2)^(3/2)) - (29*b*c^3*(
a + b*ArcSin[c*x]))/(12*d^3*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])^2/(3*d
^3*x^3*(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x])^2)/(3*d^3*x*(1 - c^2*x
^2)^2) + (35*c^4*x*(a + b*ArcSin[c*x])^2)/(12*d^3*(1 - c^2*x^2)^2) + (35*c^
4*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b*A
rcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^3 - (38*b*c^3*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^3) + (17*b^2*c^3*ArcTanh[c*x])/(6*d^3) +
 (((19*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3 + (((35*I)/4)*b*c^
3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - (((35*I)/4)
*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3 - (((19*I)/
3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (35*b^2*c^3*PolyLog[3, (-I)
*E^(I*ArcSin[c*x])])/(4*d^3) + (35*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])])
/(4*d^3)
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
```

```
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 290

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[((
c*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*n*(p + 1)), x] + Dist[(m + n*(p + 1)
 + 1)/(a*n*(p + 1)), Int[(c*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a, b
, c, m}, x] && IGtQ[n, 0] && LtQ[p, -1] && IntBinomialQ[a, b, c, n, m, p, x
]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^3}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^3x^3\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(7c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^3}\,dx+\frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x^3\left(1-c^2x^2\right)^{5/2}}\,dx}{3d^3}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2\left(a+b\sin^{-1}(cx)\right)^2}{3d^3x\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(35c^4\right)\int \frac{\left(a+b\sin^{-1}\right.}{\left(d-c^2dx\right.}$$

$$= \frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}+\frac{19bc^3\left(a+b\sin^{-1}(cx)\right)}{9d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2\left(a\right.}{3d^3}$$

$$= -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{19b^2c^4x}{18d^3\left(1-c^2x^2\right)}+\frac{bc^3\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}+\frac{1}{}$$

$$= -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{b^2c^4x}{12d^3\left(1-c^2x^2\right)}+\frac{bc^3\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{2}{}$$

$$= -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{b^2c^4x}{12d^3\left(1-c^2x^2\right)}+\frac{bc^3\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{2}{}$$

$$= -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{b^2c^4x}{12d^3\left(1-c^2x^2\right)}+\frac{bc^3\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{2}{}$$

$$= -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{b^2c^4x}{12d^3\left(1-c^2x^2\right)}+\frac{bc^3\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{2}{}$$

$$= -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{b^2c^4x}{12d^3\left(1-c^2x^2\right)}+\frac{bc^3\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{2}{}$$

Mathematica [B] time = 12.0335, size = 1657, normalized size = 2.9

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -a^2/(3*d^3*x^3) - (3*a^2*c^2)/(d^3*x) + (a^2*c^4*x)/(4*d^3*(-1 + c^2*x^2)^
2) - (11*a^2*c^4*x)/(8*d^3*(-1 + c^2*x^2)) - (35*a^2*c^3*Log[1 - c*x])/(16*
d^3) + (35*a^2*c^3*Log[1 + c*x])/(16*d^3) - (2*a*b*((c^3*((2 - c*x)*Sqrt[1
- c^2*x^2] - 3*ArcSin[c*x]))/(48*(-1 + c*x)^2) - (11*c^3*(Sqrt[1 - c^2*x^2]
 - ArcSin[c*x]))/(16*(-1 + c*x)) + (11*c^4*(Sqrt[1 - c^2*x^2] + ArcSin[c*x]
))/(16*(c + c^2*x)) + (c^3*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(
48*(1 + c*x)^2) - 3*c^2*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1 - c^2*x^2]]) +
 (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]
])/(6*x^3) + (35*c^4*((((3*I)/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/
c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi*Log[1 + I*E^(I*ArcSin[c*x]
)])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcS
in[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])])/c))/16 - (35*c^4*(((I/2)*Pi*ArcSin[c*x])/c - ((
I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c + (Pi*Log[1
- I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c
- (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/
c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/16))/d^3 - (b^2*c^3*(((-19*
I)/3)*PolyLog[2, -E^(I*ArcSin[c*x])] + ((19*I)/3)*PolyLog[2, E^(I*ArcSin[c*
x])] + (68*ArcSin[c*x] + 35*ArcSin[c*x]^3 - 105*ArcSin[c*x]^2*Log[1 - I*E^(
I*ArcSin[c*x])] - 105*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x
])))/(2*E^((I/2)*ArcSin[c*x]))] + 105*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c
*x])] + 105*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/
2)*ArcSin[c*x])] - 105*Pi*ArcSin[c*x]*Log[-((-1)^(1/4)*(-I + E^(I*ArcSin[c*
x])))/(2*E^((I/2)*ArcSin[c*x]))] - 105*ArcSin[c*x]^2*Log[((1 + I) + (1 - I)
*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] + 105*Pi*ArcSin[c*x]*Log[-Co
s[(Pi + 2*ArcSin[c*x])/4]] + 68*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]
] - 105*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 68*Log
[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 105*ArcSin[c*x]^2*Log[Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2]] + 105*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*ArcSin
[c*x])/4]] - (210*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (210*
I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + 210*PolyLog[3, (-I)*E^(I*A
rcSin[c*x])] - 210*PolyLog[3, I*E^(I*ArcSin[c*x])])/24 + (24 - 204*c*x*ArcS
in[c*x] + 204*ArcSin[c*x]^2 - 105*c*x*ArcSin[c*x]^3 + (20 + 658*ArcSin[c*x]
^2)*Cos[2*ArcSin[c*x]] - 4*(6 + 35*ArcSin[c*x]^2)*Cos[4*ArcSin[c*x]] - 20*C
os[6*ArcSin[c*x]] - 210*ArcSin[c*x]^2*Cos[6*ArcSin[c*x]] - 456*c*x*ArcSin[c
*x]*Log[1 - E^(I*ArcSin[c*x])] + 456*c*x*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*
x])] + 540*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - 204*ArcSin[c*x]*Sin[3*ArcSin[c*
x]] - 105*ArcSin[c*x]^3*Sin[3*ArcSin[c*x]] - 456*ArcSin[c*x]*Log[1 - E^(I*A
rcSin[c*x])]*Sin[3*ArcSin[c*x]] + 456*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])
]*Sin[3*ArcSin[c*x]] + 32*ArcSin[c*x]*Sin[4*ArcSin[c*x]] + 68*ArcSin[c*x]*S
in[5*ArcSin[c*x]] + 35*ArcSin[c*x]^3*Sin[5*ArcSin[c*x]] + 152*ArcSin[c*x]*L
og[1 - E^(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]] - 152*ArcSin[c*x]*Log[1 + E^(I
*ArcSin[c*x])]*Sin[5*ArcSin[c*x]] - 116*ArcSin[c*x]*Sin[6*ArcSin[c*x]] + 68
*ArcSin[c*x]*Sin[7*ArcSin[c*x]] + 35*ArcSin[c*x]^3*Sin[7*ArcSin[c*x]] + 152
*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[7*ArcSin[c*x]] - 152*ArcSin[c*x
]*Log[1 + E^(I*ArcSin[c*x])]*Sin[7*ArcSin[c*x]])/(1536*c^3*x^3*(1 - c^2*x^2
)^2)))/d^3
```

Maple [B] time = 0.494, size = 1352, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x)
```

```
[Out] -35/4*I*c^3*a*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/4*I*c^3*b^2/d^
3*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-35/4*I*c^3*b^2/d^3*a
```

```
rcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/4*I*c^3*a*b/d^3*dilog
(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-7/3*c^2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/x*ar
csin(c*x)^2-35/8*c^6*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x^3+175/24
*c^4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*x-9/4*c^3*b^2/d^3/(c^4*x^4
-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-9/4*c^3*a*b/d^3/(c^4*x^4-2*c^2
*x^2+1)*(-c^2*x^2+1)^(1/2)-35/4*c^3*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2
*x^2+1)^(1/2)))+35/4*c^3*a*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/
2)))-2/3*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)/x^3*arcsin(c*x)-1/3*c*a*b/d^3/(c^4*x
^4-2*c^2*x^2+1)/x^2*(-c^2*x^2+1)^(1/2)-1/3*c*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/
x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/3*a^2/d^3/x^3-35/16*c^3*a^2/d^3*ln(c*x
-1)+35/16*c^3*a^2/d^3*ln(c*x+1)+1/16*c^3*a^2/d^3/(c*x-1)^2-11/16*c^3*a^2/d^
3/(c*x-1)-1/16*c^3*a^2/d^3/(c*x+1)^2-11/16*c^3*a^2/d^3/(c*x+1)-3*c^2*a^2/d^
3/x-35/4*b^2*c^3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3+35/4*b^2*c^3*
polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3+19/3*I*c^3*b^2/d^3*dilog(1+I*c*
x+(-c^2*x^2+1)^(1/2))-17/3*I*c^3*b^2/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+1
9/3*I*c^3*b^2/d^3*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-1/3*c^2*b^2/d^3/(c^4*x^4-
2*c^2*x^2+1)/x+3/4*c^4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*x-5/12*c^6*b^2/d^3/(c^
4*x^4-2*c^2*x^2+1)*x^3-1/3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/x^3*arcsin(c*x)^2-
19/3*c^3*b^2/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-35/8*c^3*b^2/d^
3*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/8*c^3*b^2/d^3*arcsin(
c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+19/3*c^3*a*b/d^3*ln(I*c*x+(-c^2*x
^2+1)^(1/2)-1)-19/3*c^3*a*b/d^3*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-14/3*c^2*a*b
/d^3/(c^4*x^4-2*c^2*x^2+1)/x*arcsin(c*x)+29/12*c^5*b^2/d^3/(c^4*x^4-2*c^2*x
^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2-35/4*c^6*a*b/d^3/(c^4*x^4-2*c^2*x^
2+1)*arcsin(c*x)*x^3+29/12*c^5*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*(-c^2*x^2+
1)^(1/2)+175/12*c^4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{48}a^2\left(\frac{105\,c^3\log\left(cx+1\right)}{d^3}-\frac{105\,c^3\log\left(cx-1\right)}{d^3}-\frac{2\left(105\,c^6x^6-175\,c^4x^4+56\,c^2x^2+8\right)}{c^4d^3x^7-2\,c^2d^3x^5+d^3x^3}\right)+\frac{105\left(b^2c^7x^7-2\,b^2c^5x^5+b^2c^3x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/48*a^2*(105*c^3*log(c*x + 1)/d^3 - 105*c^3*log(c*x - 1)/d^3 - 2*(105*c^6*
x^6 - 175*c^4*x^4 + 56*c^2*x^2 + 8)/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)
) + 1/48*(105*(b^2*c^7*x^7 - 2*b^2*c^5*x^5 + b^2*c^3*x^3)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 105*(b^2*c^7*x^7 - 2*b^2*c^5*x^5
 + b^2*c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1)
- 2*(105*b^2*c^6*x^6 - 175*b^2*c^4*x^4 + 56*b^2*c^2*x^2 + 8*b^2)*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 48*(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*
x^3)*integrate(-1/24*(48*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (
105*(b^2*c^8*x^8 - 2*b^2*c^6*x^6 + b^2*c^4*x^4)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))*log(c*x + 1) - 105*(b^2*c^8*x^8 - 2*b^2*c^6*x^6 + b^2*c^4*x
^4)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(105*b^2*c
^7*x^7 - 175*b^2*c^5*x^5 + 56*b^2*c^3*x^3 + 8*b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^10 - 3*c^4
*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x))/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3
*x^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2 \arcsin(cx)^2 + 2\,ab \arcsin(cx) + a^2}{c^6 d^3 x^{10} - 3\,c^4 d^3 x^8 + 3\,c^2 d^3 x^6 - d^3 x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^10 - 3*c
^4*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

3.210 $\int x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=374

$$\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}-\frac{2bcx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}+\frac{1}{5}x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{2bx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.}{45c\sqrt{1-c^2x^2}}$$

```
[Out] (52*b^2*Sqrt[d - c^2*d*x^2])/(225*c^4) + (4*a*b*x*Sqrt[d - c^2*d*x^2])/(15*
c^3*Sqrt[1 - c^2*x^2]) + (26*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(675*c^
4) - (2*b^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c^4) + (4*b^2*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(15*c^3*Sqrt[1 - c^2*x^2]) + (2*b*x^3*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^5*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) - (2*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2)/(15*c^2) + (x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/
5
```

Rubi [A] time = 0.470417, antiderivative size = 374, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4697, 4707, 4677, 4619, 261, 4627, 266, 43}

$$\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}-\frac{2bcx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}+\frac{1}{5}x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{2bx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.}{45c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (52*b^2*Sqrt[d - c^2*d*x^2])/(225*c^4) + (4*a*b*x*Sqrt[d - c^2*d*x^2])/(15*
c^3*Sqrt[1 - c^2*x^2]) + (26*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(675*c^
4) - (2*b^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c^4) + (4*b^2*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(15*c^3*Sqrt[1 - c^2*x^2]) + (2*b*x^3*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^5*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) - (2*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2)/(15*c^2) + (x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/
5
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
```

```
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{5}x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\sqrt{d-c^2dx^2}\int\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}dx}{5\sqrt{1-c^2x^2}}-\frac{\left(2bc\sqrt{d\right.}$$

$$=-\frac{2bcx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}-\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{15c^2}+\frac{1}{5}x^4\sqrt{}$$

$$=\frac{2bx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{45c\sqrt{1-c^2x^2}}-\frac{2bcx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}-\frac{2\sqrt{d-}}{}$$

$$=\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{2bx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{45c\sqrt{1-c^2x^2}}-\frac{2bcx^5\sqrt{d-c^2dx^2}\left(a+b\right.}{25\sqrt{1-c^2x^2}}$$

$$=-\frac{2b^2\sqrt{d-c^2dx^2}}{25c^4}+\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{4b^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{75c^4}-\frac{2b^2\left(1-c^2x\right.}{1}$$

$$=\frac{52b^2\sqrt{d-c^2dx^2}}{225c^4}+\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{26b^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{675c^4}-\frac{2b^2\left(1-c^2\right.}{1}$$

Mathematica [A] time = 0.283039, size = 242, normalized size = 0.65

$$\frac{\sqrt{d-c^2dx^2}\left(225a^2\sqrt{1-c^2x^2}\left(3c^4x^4-c^2x^2-2\right)-30abcx\left(9c^4x^4-5c^2x^2-30\right)-30b\sin^{-1}(cx)\left(15a\sqrt{1-c^2x^2}\left(-3c^4x^4+\right.\right.\right.}{3375}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(225*a^2*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4)
- 30*a*b*c*x*(-30 - 5*c^2*x^2 + 9*c^4*x^4) - 2*b^2*Sqrt[1 - c^2*x^2]*(-428
+ 11*c^2*x^2 + 27*c^4*x^4) - 30*b*(15*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2 - 3*
c^4*x^4) + b*c*x*(-30 - 5*c^2*x^2 + 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*Sqrt[
1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]^2))/(3375*c^4*Sqrt[1 -
c^2*x^2])
```

Maple [C] time = 0.428, size = 1238, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] a^2*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2))+b
^2*(1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(
1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(c^2*x^2-1)+1/864*(-d
*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I
*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/(c^2*x^2
-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsi
n(c*x)^2-2+2*I*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*
```

```
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^4/(c^
2*x^2-1)+1/864*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4
*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x
)^2-2)/c^4/(c^2*x^2-1)+1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/
2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*
x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(
c^2*x^2-1))+2*a*b*(1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I
*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)+1/288*(-d*(c^2*
x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2
*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1)
)^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/(c^2*x^2-1
)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(
c*x)-I)/c^4/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2
)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*
x))/c^4/(c^2*x^2-1)+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x
^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+
1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))/c^4/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.67149, size = 610, normalized size = 1.63

$$30\left(9\,abc^5x^5 - 5\,abc^3x^3 - 30\,abcx + \left(9\,b^2c^5x^5 - 5\,b^2c^3x^3 - 30\,b^2cx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}\sqrt{-c^2x^2 + 1} + \left(27\left(25\,a^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] 1/3375*(30*(9*a*b*c^5*x^5 - 5*a*b*c^3*x^3 - 30*a*b*c*x + (9*b^2*c^5*x^5 - 5
*b^2*c^3*x^3 - 30*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2
+ 1) + (27*(25*a^2 - 2*b^2)*c^6*x^6 - 4*(225*a^2 - 8*b^2)*c^4*x^4 - (225*a^
2 - 878*b^2)*c^2*x^2 + 225*(3*b^2*c^6*x^6 - 4*b^2*c^4*x^4 - b^2*c^2*x^2 + 2
*b^2)*arcsin(c*x)^2 + 450*a^2 - 856*b^2 + 450*(3*a*b*c^6*x^6 - 4*a*b*c^4*x^
4 - a*b*c^2*x^2 + 2*a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3\sqrt{-d\left(cx - 1\right)\left(cx + 1\right)}\left(a + b\operatorname{asin}\left(cx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)^2 x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^3, x)
```

3.211 $\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=303

$$-\frac{bcx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{bx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2}}{}$$

```
[Out] (b^2*x*Sqrt[d - c^2*d*x^2])/(64*c^2) - (b^2*x^3*Sqrt[d - c^2*d*x^2])/32 - (
b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/4 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(24*b*c^3
*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.384435, antiderivative size = 303, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {4697, 4707, 4641, 4627, 321, 216}

$$-\frac{bcx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{bx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (b^2*x*Sqrt[d - c^2*d*x^2])/(64*c^2) - (b^2*x^3*Sqrt[d - c^2*d*x^2])/32 - (
b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/4 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(24*b*c^3
*Sqrt[1 - c^2*x^2])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\sqrt{d-c^2dx^2}\int\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-\right.}{}$$

$$=-\frac{bcx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{8c^2}+\frac{1}{4}x^3\sqrt{d-}$$

$$=-\frac{1}{32}b^2x^3\sqrt{d-c^2dx^2}+\frac{bx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}\left(a+b\right.}{8\sqrt{1-c^2x^2}}$$

$$=\frac{b^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d-c^2dx^2}+\frac{bx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}}-\frac{bcx^4}{}$$

$$=\frac{b^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d-c^2dx^2}-\frac{b^2\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{bx^2\sqrt{d-c^2dx^2}}{8c\sqrt{}}$$

Mathematica [A] time = 0.320611, size = 246, normalized size = 0.81

$$\frac{\sqrt{d-c^2dx^2}\left(-3b\sin^{-1}(cx)\left(-8a^2+16abcx\left(1-2c^2x^2\right)\sqrt{1-c^2x^2}+b^2\left(8c^4x^4-8c^2x^2+1\right)\right)+24a^2bcx\sqrt{1-c^2x^2}\left(2c^2x^2-\right.}{192}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(8*a^3 + 3*b^3*c*x*(1 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] -
 24*a*b^2*c^2*x^2*(-1 + c^2*x^2) + 24*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c
^2*x^2) - 3*b*(-8*a^2 + 16*a*b*c*x*(1 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + b^2*
(1 - 8*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + 24*b^2*(a + b*c*x*Sqrt[1 - c^2*x
```

```
^2]*(-1 + 2*c^2*x^2))*ArcSin[c*x]^2 + 8*b^3*ArcSin[c*x]^3))/(192*b*c^3*Sqrt
[1 - c^2*x^2])
```

Maple [B] time = 0.331, size = 812, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/4*a^2*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/8*a^2/c^2*x*(-c^2*d*x^2+d)^(1/2)+1/
8*a^2/c^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/64
*b^2*(-d*(c^2*x^2-1))^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-
1/32*b^2*(-d*(c^2*x^2-1))^(1/2)*c^2/(c^2*x^2-1)*x^5+3/64*b^2*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)*x^3-1/64*b^2*(-d*(c^2*x^2-1))^(1/2)/c^2/(c^2*x^2-1)*x+
1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*c^2/(c^2*x^2-1)*arcsin(c*x)^2*x^5-3/8*b^2*(-
d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*x^3+1/8*b^2*(-d*(c^2*x^2-1))
^(1/2)/c^2/(c^2*x^2-1)*arcsin(c*x)^2*x-1/24*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3+1/8*b^2*(-d*(c^2*x^2-1))^(1/2)
*c/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4-1/8*b^2*(-d*(c^2*x^2-1))^
(1/2)/c/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+1/8*a*b*(-d*(c^2*x^2
-1))^(1/2)*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-1/8*a*b*(-d*(c^2*x^2-1))^(1
/2)/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+1/2*a*b*(-d*(c^2*x^2-1))^(1/2)*c^2
/(c^2*x^2-1)*arcsin(c*x)*x^5-3/4*a*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arc
sin(c*x)*x^3+1/4*a*b*(-d*(c^2*x^2-1))^(1/2)/c^2/(c^2*x^2-1)*arcsin(c*x)*x+1
/64*a*b*(-d*(c^2*x^2-1))^(1/2)/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-1/8*a*b*(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b^2x^2\arcsin\left(cx\right)^2+2\,abx^2\arcsin\left(cx\right)+a^2x^2\right)\sqrt{-c^2dx^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c^
2*d*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^2, x)
```

3.212 $\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=188

$$-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d}+\frac{2b^2\left(1-\right.}{}$$

```
[Out] (4*b^2*Sqrt[d - c^2*d*x^2])/(9*c^2) + (2*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x
^2])/(27*c^2) + (2*b*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1
 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[
1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```

Rubi [A] time = 0.159379, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4677, 4645, 444, 43}

$$-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d}+\frac{2b^2\left(1-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (4*b^2*Sqrt[d - c^2*d*x^2])/(9*c^2) + (2*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x
^2])/(27*c^2) + (2*b*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1
 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[
1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```


Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=-\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d}+\frac{\left(2b\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.}{3c\sqrt{1-c^2x^2}}$$

$$=\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}-\frac{\left(d-c^2d\right.}{}$$

$$=\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}-\frac{\left(d-c^2d\right.}{}$$

$$=\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}-\frac{\left(d-c^2d\right.}{}$$

$$=\frac{4b^2\sqrt{d-c^2dx^2}}{9c^2}+\frac{2b^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{27c^2}+\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-$$

Mathematica [A] time = 0.259402, size = 120, normalized size = 0.64

$$\frac{\sqrt{d-c^2dx^2}\left(\left(c^2x^2-1\right)\left(a+b\sin^{-1}(cx)\right)^2-\frac{2b\left(3acx\left(c^2x^2-3\right)+b\sqrt{1-c^2x^2}\left(c^2x^2-7\right)+3bcx\left(c^2x^2-3\right)\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}\right)}{3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((-1 + c^2*x^2)*(a + b*ArcSin[c*x])^2 - (2*b*(b*Sqrt[1
 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 + c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2
)*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2])))/(3*c^2)
```

Maple [C] time = 0.226, size = 700, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/3*a^2/c^2/d*(-c^2*d*x^2+d)^(3/2)+b^2*(1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^
4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1
)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x)
)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*
x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^2/(c^2*x^2-1)+1/216*(-d*(c^2*x^2
-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)
*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1))+2*a
*b*(1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)
```

```
*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)-1/
8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+
I)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2
*x^2-1)*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*
(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))
```

Maxima [A] time = 1.68768, size = 254, normalized size = 1.35

$$-\frac{2}{27}b^2\left(\frac{\sqrt{-c^2x^2+1}d^{\frac{3}{2}}x^2-\frac{7\sqrt{-c^2x^2+1}d^{\frac{3}{2}}}{c^2}}{d}+\frac{3\left(c^2d^{\frac{3}{2}}x^3-3d^{\frac{3}{2}}x\right)\arcsin(cx)}{cd}\right)-\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}b^2\arcsin(cx)^2}{3c^2d}-\frac{2\left(-c^2dx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -2/27*b^2*((sqrt(-c^2*x^2 + 1)*d^(3/2)*x^2 - 7*sqrt(-c^2*x^2 + 1)*d^(3/2)/c
^2)/d + 3*(c^2*d^(3/2)*x^3 - 3*d^(3/2)*x)*arcsin(c*x)/(c*d)) - 1/3*(-c^2*d*
x^2 + d)^(3/2)*b^2*arcsin(c*x)^2/(c^2*d) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a*b*a
rcsin(c*x)/(c^2*d) - 2/9*(c^2*d^(3/2)*x^3 - 3*d^(3/2)*x)*a*b/(c*d) - 1/3*(-
c^2*d*x^2 + d)^(3/2)*a^2/(c^2*d)
```

Fricas [A] time = 2.49072, size = 450, normalized size = 2.39

$$\frac{6\left(abc^3x^3-3abcx+\left(b^2c^3x^3-3b^2cx\right)\arcsin(cx)\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+\left(\left(9a^2-2b^2\right)c^4x^4-2\left(9a^2-8b^2\right)c^2x^2\right.}{27\left(c^4x^2-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27*(6*(a*b*c^3*x^3 - 3*a*b*c*x + (b^2*c^3*x^3 - 3*b^2*c*x)*arcsin(c*x))*s
qrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + ((9*a^2 - 2*b^2)*c^4*x^4 - 2*(9*a^
2 - 8*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 +
9*a^2 - 14*b^2 + 18*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 + a*b)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)^2 x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x, x)
```

3.213 $\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=192

$$\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2-\frac{bcx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{1}{4}b^2x\sqrt{d-c^2d}$$

```
[Out] -(b^2*x*Sqrt[d - c^2*d*x^2])/4 + (b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4*c
*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*
Sqrt[1 - c^2*x^2]) + (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 + (Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.114679, antiderivative size = 192, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4647, 4641, 4627, 321, 216}

$$\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2-\frac{bcx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{1}{4}b^2x\sqrt{d-c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] -(b^2*x*Sqrt[d - c^2*d*x^2])/4 + (b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4*c
*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*
Sqrt[1 - c^2*x^2]) + (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 + (Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
```

```
x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
+ 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\sqrt{d-c^2dx^2}\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bc\sqrt{d-c^2dx\right.}}{}$$

$$= -\frac{bcx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\sqrt{d-c^2d}}{6}$$

$$= -\frac{1}{4}b^2x\sqrt{d-c^2dx^2} - \frac{bcx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.$$

$$= -\frac{1}{4}b^2x\sqrt{d-c^2dx^2} + \frac{b^2\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{4c\sqrt{1-c^2x^2}} - \frac{bcx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} +$$

Mathematica [A] time = 0.214474, size = 128, normalized size = 0.67

$$\frac{1}{6}\sqrt{d-c^2dx^2}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^3}{bc\sqrt{1-c^2x^2}} - \frac{3b\left(cx\left(2acx+b\sqrt{1-c^2x^2}\right)+b\left(2c^2x^2-1\right)\sin^{-1}(cx)\right)}{2c\sqrt{1-c^2x^2}} + 3x\left(a+b\sin^{-1}(cx)\right)^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(3*x*(a + b*ArcSin[c*x])^2 + (a + b*ArcSin[c*x])^3/(b*
c*Sqrt[1 - c^2*x^2]) - (3*b*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 +
2*c^2*x^2)*ArcSin[c*x]))/(2*c*Sqrt[1 - c^2*x^2])))/6
```

Maple [B] time = 0.169, size = 564, normalized size = 2.9

$$\frac{xa^2}{2}\sqrt{-c^2dx^2+d} + \frac{a^2d}{2}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}} - \frac{b^2\left(\arcsin(cx)\right)^3}{6c\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1} + \frac{b^2c^2\left(\arcsin\right.}{2c^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/2*x*(-c^2*d*x^2+d)^(1/2)*a^2+1/2*a^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2))-1/6*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
c/(c^2*x^2-1)*arcsin(c*x)^3+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^2/(c^2*x^2-1)*
arcsin(c*x)^2*x^3-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*
x-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*c^2/(c^2*x^2-1)*x^3+1/4*b^2*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)*x-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)/c/(c^2*x^2-1)*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*c/(c^2*x^2-1)*arcsin
```

```
(c*x)*(-c^2*x^2+1)^(1/2)*x^2-1/2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1
/2)/c/(c^2*x^2-1)*arcsin(c*x)^2+a*b*(-d*(c^2*x^2-1))^(1/2)*c^2/(c^2*x^2-1)*
arcsin(c*x)*x^3+1/2*a*b*(-d*(c^2*x^2-1))^(1/2)*c/(c^2*x^2-1)*(-c^2*x^2+1)^(
1/2)*x^2-a*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x-1/4*a*b*(-d*(
c^2*x^2-1))^(1/2)/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{-c^2dx^2+d}\left(b\arcsin\left(cx\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2, x)
```

3.214 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx$

Optimal. Leaf size=378

$$\frac{2ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2}{}$$

```
[Out] -2*b^2*Sqrt[d - c^2*d*x^2] - (2*a*b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x
^2] - (2*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] - ((2*I)*b*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*Ar
cSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3,
E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.348865, antiderivative size = 378, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4697, 4709, 4183, 2531, 2282, 6589, 4619, 261}

$$\frac{2ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ib\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x,x]
```


```
[Out] -2*b^2*Sqrt[d - c^2*d*x^2] - (2*a*b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x
^2] - (2*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] - ((2*I)*b*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*Ar
cSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3,
E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}dx = \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\sqrt{d-c^2dx^2}\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}dx}{\sqrt{1-c^2x^2}} - \frac{\left(2bc\sqrt{d-c^2dx^2}\right)}{\sqrt{\ }}$$

$$= -\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int(a+b\right.}{\sqrt{1-}}$$

$$= -\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2$$

$$= -2b^2\sqrt{d-c^2dx^2} - \frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\,($$

$$= -2b^2\sqrt{d-c^2dx^2} - \frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\,($$

$$= -2b^2\sqrt{d-c^2dx^2} - \frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\,($$

Mathematica [A] time = 1.1164, size = 391, normalized size = 1.03

$$\frac{2ab\sqrt{d-c^2dx^2}\left(i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\sin^{-1}(cx)-cx+\sin^{-1}(cx)\log\left(1-e^{i\sin}\right.\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] a^2*Sqrt[d - c^2*d*x^2] + a^2*Sqrt[d]*Log[c*x] - a^2*Sqrt[d]*Log[d + Sqrt[d
]*Sqrt[d - c^2*d*x^2]] + (2*a*b*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*
x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log
[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E
^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (b^2*Sqrt[d - c^2*d*x^2]*(-2*Sqrt[1
 - c^2*x^2] - 2*c*x*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + ArcSin[
c*x]^2*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])
] + (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*Po
lyLog[2, E^(I*ArcSin[c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[
3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [B] time = 0.274, size = 1017, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] -d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)*a^2+(-c^2*d*x^2+d)^(1/2
)*a^2+b^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*x^2*c^2+2*b^2*(-
d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x*c-2*b^2*(
-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*c^2*x^2-b^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x
^2-1)*arcsin(c*x)^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)+b^2*(-d*(c^2*x
```

```
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arc
sin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)
)-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)
*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/(c^2*x^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(
1/2))+2*a*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2+2*a*b*(-
d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c-2*a*b*(-d*(c^2*x^2-
1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)+2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)
^(1/2)/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*c*x-(-c^2
*x^2+1)^(1/2))-2*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1
)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/(c^2*x^2-1)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2/x, x)
```

3.215 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=227

$$-\frac{ib^2c\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{3b\sqrt{1-c^2x^2}}-\frac{ic\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}-\frac{\sqrt{d-}}{}$$

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) + (2*b*c*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*S
qrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.319508, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4693, 4625, 3717, 2190, 2279, 2391, 4641}

$$-\frac{ib^2c\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{3b\sqrt{1-c^2x^2}}-\frac{ic\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}-\frac{\sqrt{d-}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) + (2*b*c*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*S
qrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}+\frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int\frac{a+b\sin^{-1}(cx)}{x}\,dx}{\sqrt{1-c^2x^2}}-\frac{\left(c^2\sqrt{d-c^2\right.}}{}$$

$$= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}-\frac{c\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{3b\sqrt{1-c^2x^2}}+\frac{\left(2bc\sqrt{d-c^2d\right.}}{}$$

$$= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}-\frac{ic\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d-c^2dx^2}}{3b\sqrt{}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}-\frac{ic\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d-c^2dx^2}}{3b\sqrt{}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}-\frac{ic\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d-c^2dx^2}}{3b\sqrt{}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}-\frac{ic\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d-c^2dx^2}}{3b\sqrt{}}$$

Mathematica [A] time = 0.977293, size = 257, normalized size = 1.13

$$-\frac{b^2c\sqrt{d-c^2dx^2}\left(3i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)\left(\left(\frac{3\sqrt{1-c^2x^2}}{cx}+3i\right)\sin^{-1}(cx)+\sin^{-1}(cx)^2-6\log\left(1-e^{2i\sin^{-1}(cx)}\right)\right)\right)}{3\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((a^2*Sqrt[d - c^2*d*x^2])/x) + a^2*c*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x
^2])/(Sqrt[d]*(-1 + c^2*x^2))] - (a*b*Sqrt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x
```

```
^2]*ArcSin[c*x] + c*x*ArcSin[c*x]^2 - 2*c*x*Log[c*x]))/(x*Sqrt[1 - c^2*x^2]
) - (b^2*c*Sqrt[d - c^2*d*x^2]*(ArcSin[c*x]*((3*I + (3*Sqrt[1 - c^2*x^2])/(
c*x))*ArcSin[c*x] + ArcSin[c*x]^2 - 6*Log[1 - E^((2*I)*ArcSin[c*x])]) + (3*
I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.27, size = 762, normalized size = 3.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] -a^2/d/x*(-c^2*d*x^2+d)^(3/2)-a^2*c^2*x*(-c^2*d*x^2+d)^(1/2)-a^2*c^2*d/(c^2
*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/3*b^2*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*c+2*I*b^2*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*c*polylog(2,I*c*x+(-c^2*x^2+1)
^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)*x*c^2+b^2*(-d*
(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/x-2*b^2*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*c*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)
)-2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*c*arcsin(c*x)
*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/
(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/(c^2*x^2-1)*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+a*b*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c+2*I*a*b*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c-2*a*b*(-d*(c^2*x
^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)*x*c^2+2*a*b*(-d*(c^2*x^2-1))^(1/2)*arc
sin(c*x)/(c^2*x^2-1)/x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2
*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^{2}dx^{2}+d}\left(b\arcsin\left(cx\right)+a\right)^{2}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2/x^2, x)
```

3.216 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx$

Optimal. Leaf size=398

$$-\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}$$

```
[Out] -((b*c*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^
2*c^2*Sqrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - (
I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] + (I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (b^2*c^2*Sqrt[d - c^2*d*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*Sqrt[d - c
^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.38195, antiderivative size = 398, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {4693, 4627, 266, 63, 208, 4709, 4183, 2531, 2282, 6589}

$$-\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{ibc^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^3,x]
```


```
[Out] -((b*c*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^
2*c^2*Sqrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - (
I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] + (I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (b^2*c^2*Sqrt[d - c^2*d*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*Sqrt[d - c
^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x^2}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(c^2\sqrt{d-\right.}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} - \frac{\left(c^2\sqrt{d-c^2\right.}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} + \frac{c^2\sqrt{d-c^2c}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} + \frac{c^2\sqrt{d-c^2c}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} + \frac{c^2\sqrt{d-c^2c}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} + \frac{c^2\sqrt{d-c^2c}}{}$$

Mathematica [A] time = 5.06273, size = 480, normalized size = 1.21

$$\frac{1}{8}\left(\frac{2abc^2d\sqrt{1-c^2x^2}\left(-4i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+4i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-4\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right)+4\sin\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] ((-4*a^2*Sqrt[d - c^2*d*x^2])/x^2 - 4*a^2*c^2*Sqrt[d]*Log[x] + 4*a^2*c^2*Sq
rt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*c^2*d*Sqrt[1 - c^2*x^2]
*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*
Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*
I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + A
rcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2
] + (b^2*c^2*d*Sqrt[1 - c^2*x^2]*(-4*ArcSin[c*x]*Cot[ArcSin[c*x]/2] - ArcSi
n[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]^2*Log[1 - E^(I*ArcSin[c*x])]
+ 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[ArcSin[c*x]/2]] -
(8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (8*I)*ArcSin[c*x]*PolyLo
g[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(I*ArcSin[c*x])] - 8*PolyLog[3, E
^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Tan[
ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2])/8
```

Maple [B] time = 0.342, size = 1082, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x)
```

```
[Out] -1/2*a^2/d/x^2*(-c^2*d*x^2+d)^(3/2)+1/2*a^2*d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2
*d*x^2+d)^(1/2))/x)*c^2-1/2*a^2*(-c^2*d*x^2+d)^(1/2)*c^2-1/2*b^2*arcsin(c*x
```

```
)^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*c^2+b^2*arcsin(c*x)*(-d*(c^2*x^2-1))
^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/2*b^2*arcsin(c*x)^2*(-d*(c^2*x^
2-1))^(1/2)/x^2/(c^2*x^2-1)-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)*c^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/2*b^2*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1-I
*c*x-(-c^2*x^2+1)^(1/2))+I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^
2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*a*b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(c^2*x^2
-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)*c^2/(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(c^2*x^2-1)*arctanh(I*c*x+(-c^2*x^
2+1)^(1/2))-a*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c^2+a*b*(-d*
(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+a*b*arcsin(c*x)*(-d*(
c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)
^(1/2)*c^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*a*b*(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1
-I*c*x-(-c^2*x^2+1)^(1/2))-I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*
c^2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*a*b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2-2)*polylog(2,-I*c*x-(
-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)^2}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2/x^3, x)
```

3.217 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx$

Optimal. Leaf size=314

$$\frac{ib^2c^3\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{1-c^2x^2}}+\frac{ic^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}\cdot$$

```
[Out] -(b^2*c^2*Sqrt[d - c^2*d*x^2])/(3*x) - (b^2*c^3*Sqrt[d - c^2*d*x^2]*ArcSin[
c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x]))/(3*x^2) + ((I/3)*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^2)/Sqrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(
3*d*x^3) - (2*b*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I
)*ArcSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + ((I/3)*b^2*c^3*Sqrt[d - c^2*d*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.271609, antiderivative size = 314, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {4681, 4685, 277, 216, 4625, 3717, 2190, 2279, 2391}

$$\frac{ib^2c^3\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{1-c^2x^2}}+\frac{ic^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}\cdot$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -(b^2*c^2*Sqrt[d - c^2*d*x^2])/(3*x) - (b^2*c^3*Sqrt[d - c^2*d*x^2]*ArcSin[
c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x]))/(3*x^2) + ((I/3)*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^2)/Sqrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(
3*d*x^3) - (2*b*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I
)*ArcSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + ((I/3)*b^2*c^3*Sqrt[d - c^2*d*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4685

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcSin[c*x
]))/(f*(m + 1)), x] + (-Dist[(b*c*d^p)/(f*(m + 1)), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} + \frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3} + \left(\right.$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+\right.}{3dx^3}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{3x^2}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{3x^2}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{3x^2}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{3x^2}$$

Mathematica [A] time = 1.18935, size = 248, normalized size = 0.79

$$\frac{\sqrt{d-c^2dx^2}\left(2ib^2c^3x^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-2\left(a^2\left(1-c^2x^2\right)^{3/2}+2abc^3x^3\log(cx)+abcx+b^2c^2x^2\sqrt{1-c^2x^2}\right)-b\sin^{-1}\right.}{6}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(2*b^2*(I*c^3*x^3 - Sqrt[1 - c^2*x^2] + c^2*x^2*Sqrt[1
 - c^2*x^2])*ArcSin[c*x]^2 - b*ArcSin[c*x]*(2*b*c*x + 3*a*Sqrt[1 - c^2*x^2]
 + a*Cos[3*ArcSin[c*x]] + 4*b*c^3*x^3*Log[1 - E^((2*I)*ArcSin[c*x])]) - 2*(
a*b*c*x + b^2*c^2*x^2*Sqrt[1 - c^2*x^2] + a^2*(1 - c^2*x^2)^(3/2) + 2*a*b*c
^3*x^3*Log[c*x]) + (2*I)*b^2*c^3*x^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(6
*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.361, size = 3017, normalized size = 9.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x)
```

```
[Out] 2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*ar
csin(c*x)*c^6-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/
(c^2*x^2-1)*arcsin(c*x)*c^8+1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c
^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3-1/3*I*b^2*(-d*(c
^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4+I*b^
2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+
1)^(1/2)*c^5+b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^
```

```
2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+2*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4
*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-1/3*I*a*b*(-d*(c^2*x^2-1)
)^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+2/3*I*a*b*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-1/3*I*a*b*(-d*(c^2*x^
2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+1/3*b^2*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*c-6*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1
)*arcsin(c*x)*c^6+a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+20/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4
-3*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-10/3*a*b*(-d*(c^2*x^2-1))^(1/2)
/(3*c^4*x^4-3*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^2+1/3*a*b*(-d*(c^2*x^2
-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-I*b
^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2
+1)^(1/2)*c^7-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
*c^3/(3*c^2*x^2-3)-5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x
/(c^2*x^2-1)*arcsin(c*x)^2*c^2-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-
3*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-2*I*b^2*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3)*arcsin(c*x)^2-2*I*b^2*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3)*polylog(2,-I*c*x-(-c^2*x^2+
1)^(1/2))-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-
3)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^
4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+2*b^2*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2
+1)^(1/2))+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3
)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)/(3*
c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+b^2*(-d
*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)^2*c
^8-3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*arc
sin(c*x)^2*c^6+10/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c
^2*x^2-1)*arcsin(c*x)^2*c^4-a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2
+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^
4*x^4-3*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+2/3*a*b*(-d*(c^2*x^2-1))^(1/
2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^3+1/
3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin
(c*x)*(-c^2*x^2+1)*c^4-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+
1)*x^5/(c^2*x^2-1)*c^8+5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+
1)*x^3/(c^2*x^2-1)*c^6-4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+
1)*x/(c^2*x^2-1)*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)
/x/(c^2*x^2-1)*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x
^3/(c^2*x^2-1)*arcsin(c*x)^2+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^
2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-2*I*a*b*(-d*(c^
2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x
^2+1)^(1/2)*c^5-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^
3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-
3*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4+2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2
)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+I*
b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c
*x)^2*(-c^2*x^2+1)^(1/2)*c^7-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*
c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)*c^6-I*b^2*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1
)^(1/2)*c^5-1/3*a^2/d/x^3*(-c^2*d*x^2+d)^(3/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-c^2dx^2+d}\left(b\arcsin\left(cx\right)+a\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2/x^4, x)
```

3.218 $\int x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=503

$$\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{49\sqrt{1-c^2x^2}}-\frac{16bcdx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{175\sqrt{1-c^2x^2}}+\frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}$$

```
[Out] (304*b^2*d*Sqrt[d - c^2*d*x^2])/(3675*c^4) + (4*a*b*d*x*Sqrt[d - c^2*d*x^2]
)/(35*c^3*Sqrt[1 - c^2*x^2]) + (152*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]
)/(11025*c^4) + (38*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(6125*c^4) -
 (2*b^2*d*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^4) + (4*b^2*d*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(35*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(105*c*Sqrt[1 - c^2*x^2]) - (16*b*c*d*x^5
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(175*Sqrt[1 - c^2*x^2]) + (2*b*c^
3*d*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(49*Sqrt[1 - c^2*x^2]) - (
2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^4) - (d*x^2*Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^2) + (3*d*x^4*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])^2)/35 + (x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/7
```

Rubi [A] time = 0.779804, antiderivative size = 503, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 14, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.483, Rules used = {4699, 4697, 4707, 4677, 4619, 261, 4627, 266, 43, 14, 4687, 12, 446, 77}

$$\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{49\sqrt{1-c^2x^2}}-\frac{16bcdx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{175\sqrt{1-c^2x^2}}+\frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (304*b^2*d*Sqrt[d - c^2*d*x^2])/(3675*c^4) + (4*a*b*d*x*Sqrt[d - c^2*d*x^2]
)/(35*c^3*Sqrt[1 - c^2*x^2]) + (152*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]
)/(11025*c^4) + (38*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(6125*c^4) -
 (2*b^2*d*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^4) + (4*b^2*d*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(35*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(105*c*Sqrt[1 - c^2*x^2]) - (16*b*c*d*x^5
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(175*Sqrt[1 - c^2*x^2]) + (2*b*c^
3*d*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(49*Sqrt[1 - c^2*x^2]) - (
2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^4) - (d*x^2*Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^2) + (3*d*x^4*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])^2)/35 + (x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/7
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rubi steps

$$\int x^3 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{7}x^4 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{7}(3d) \int x^3 \sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx\right.$$

$$= -\frac{2bcdx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{35\sqrt{1-c^2x^2}} + \frac{2bc^3dx^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{49\sqrt{1-c^2x^2}}$$

$$= -\frac{16bcdx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{175\sqrt{1-c^2x^2}} + \frac{2bc^3dx^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{49\sqrt{1-c^2x^2}}$$

$$= \frac{2bdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{105c\sqrt{1-c^2x^2}} - \frac{16bcdx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{175\sqrt{1-c^2x^2}} +$$

$$= \frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{2bdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{105c\sqrt{1-c^2x^2}} - \frac{16bcdx^5\sqrt{d-c^2dx}}{175\sqrt{1}}$$

$$= -\frac{62b^2d\sqrt{d-c^2dx^2}}{1225c^4} + \frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{74b^2d\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{3675c^4} + \frac{38}{}$$

$$= \frac{304b^2d\sqrt{d-c^2dx^2}}{3675c^4} + \frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{152b^2d\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{11025c^4} + \frac{3}{}$$

Mathematica [A] time = 0.304257, size = 244, normalized size = 0.49

$$\frac{d\sqrt{d-c^2dx^2}\left(-11025a^2\left(5c^2x^2+2\right)\left(1-c^2x^2\right)^{5/2} + 210abcx\left(75c^6x^6-168c^4x^4+35c^2x^2+210\right) + 210b\sin^{-1}(cx)\left(bcx\left(75\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-11025*a^2*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + 21
0*a*b*c*x*(210 + 35*c^2*x^2 - 168*c^4*x^4 + 75*c^6*x^6) + 2*b^2*Sqrt[1 - c^
2*x^2]*(18692 - 1679*c^2*x^2 - 2178*c^4*x^4 + 1125*c^6*x^6) + 210*b*(-105*a
*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + b*c*x*(210 + 35*c^2*x^2 - 168*c^4*x^
4 + 75*c^6*x^6))*ArcSin[c*x] - 11025*b^2*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2
)*ArcSin[c*x]^2))/(385875*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.497, size = 1882, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] a^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+b
^2*(-1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+
1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(14*I*arcsin(c*
x)+49*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)+1/16000*(-d*(c^2*x^2-1))^(1/2)*(16
```

```
*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcs
in(c*x)^2-2)*d/c^4/(c^2*x^2-1)+1/1152*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c
^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*ar
csin(c*x)+9*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)
*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c
^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x
^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/1152*(-d*(c^2*x
^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/
2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)+
1/16000*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-
20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^
2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-1/43904*(
-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c
^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4
*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(
c*x)^2-2)*d/c^4/(c^2*x^2-1))+2*a*b*(-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*
x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2
+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+
1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/3200*(-d*(c^2*x^2-1))
^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x
))*d/c^4/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*
d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2
)*x*c-1)*(arcsin(c*x)+I)*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^4/(c^2*x^2-1)+1/384*(
-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x
^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/3200*(-
d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2
*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(
-I+5*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c
^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6
*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c
-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/c^4/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")

[Out] Exception raised: ValueError
```

Fricas [A] time = 2.7937, size = 853, normalized size = 1.7

$$-\frac{210\left(75\,abc^7dx^7-168\,abc^5dx^5+35\,abc^3dx^3+210\,abcdx+\left(75\,b^2c^7dx^7-168\,b^2c^5dx^5+35\,b^2c^3dx^3+210\,b^2cdx\right)\mathrm{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] -1/385875*(210*(75*a*b*c^7*d*x^7 - 168*a*b*c^5*d*x^5 + 35*a*b*c^3*d*x^3 + 2
10*a*b*c*d*x + (75*b^2*c^7*d*x^7 - 168*b^2*c^5*d*x^5 + 35*b^2*c^3*d*x^3 + 2
10*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + (1125*
(49*a^2 - 2*b^2)*c^8*d*x^8 - 9*(15925*a^2 - 734*b^2)*c^6*d*x^6 + (99225*a^2
 - 998*b^2)*c^4*d*x^4 + (11025*a^2 - 40742*b^2)*c^2*d*x^2 + 11025*(5*b^2*c^
8*d*x^8 - 13*b^2*c^6*d*x^6 + 9*b^2*c^4*d*x^4 + b^2*c^2*d*x^2 - 2*b^2*d)*arc
sin(c*x)^2 - 2*(11025*a^2 - 18692*b^2)*d + 22050*(5*a*b*c^8*d*x^8 - 13*a*b*
c^6*d*x^6 + 9*a*b*c^4*d*x^4 + a*b*c^2*d*x^2 - 2*a*b*d)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^2x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^3, x)
```

3.219 $\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=421

$$\frac{bc^3dx^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{18\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{48\sqrt{1-c^2x^2}}+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{8}$$

```
[Out] (-7*b^2*d*x*Sqrt[d - c^2*d*x^2])/(1152*c^2) - (43*b^2*d*x^3*Sqrt[d - c^2*d*
x^2])/1728 + (b^2*c^2*d*x^5*Sqrt[d - c^2*d*x^2])/108 + (7*b^2*d*Sqrt[d - c^
2*d*x^2]*ArcSin[c*x])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^2*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^2)/8 + (x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(48*b*c^3*Sqrt[1 - c^2*x
^2])
```

Rubi [A] time = 0.709541, antiderivative size = 421, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4699, 4697, 4707, 4641, 4627, 321, 216, 14, 4687, 12, 459}

$$\frac{bc^3dx^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{18\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{48\sqrt{1-c^2x^2}}+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{8}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-7*b^2*d*x*Sqrt[d - c^2*d*x^2])/(1152*c^2) - (43*b^2*d*x^3*Sqrt[d - c^2*d*
x^2])/1728 + (b^2*c^2*d*x^5*Sqrt[d - c^2*d*x^2])/108 + (7*b^2*d*Sqrt[d - c^
2*d*x^2]*ArcSin[c*x])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^2*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^2)/8 + (x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(48*b*c^3*Sqrt[1 - c^2*x
^2])
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
```

```
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
```

```
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rubi steps

$$\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{2}d\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.$$

$$= -\frac{bcdx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{12\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{18\sqrt{1-c^2x^2}}$$

$$= -\frac{7bcdx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{48\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{18\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{64}b^2dx^3\sqrt{d-c^2dx^2}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}+\frac{bdx^2\sqrt{d-c^2dx^2}\left(a+b\right.}{16c\sqrt{1-c^2x^2}}$$

$$= \frac{b^2dx\sqrt{d-c^2dx^2}}{128c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}+\frac{bdx^2\sqrt{}}{}$$

$$= -\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}-\frac{b^2d}{}$$

$$= -\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}+\frac{7b^2}{}$$

Mathematica [A] time = 0.312958, size = 297, normalized size = 0.71

$$\frac{d\sqrt{d-c^2dx^2}\left(3b\sin^{-1}(cx)\left(72a^2-48abcx\sqrt{1-c^2x^2}\left(8c^4x^4-14c^2x^2+3\right)+b^2\left(64c^6x^6-168c^4x^4+72c^2x^2+7\right)\right)-72\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(72*a^3 + 24*a*b^2*c^2*x^2*(9 - 21*c^2*x^2 + 8*c^4*x
^4) - 72*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + b^3*c*x
*Sqrt[1 - c^2*x^2]*(-21 - 86*c^2*x^2 + 32*c^4*x^4) + 3*b*(72*a^2 - 48*a*b*c
*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + b^2*(7 + 72*c^2*x^2 - 1
68*c^4*x^4 + 64*c^6*x^6))*ArcSin[c*x] + 72*b^2*(3*a + b*c*x*Sqrt[1 - c^2*x^
2]*(-3 + 14*c^2*x^2 - 8*c^4*x^4))*ArcSin[c*x]^2 + 72*b^3*ArcSin[c*x]^3))/(3
456*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.48, size = 1075, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/18*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)*x^6-1/16*a*b*(-d*(c^2*x^2-1))^(1/2)*d/c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*x^2+7/48*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*x^4-1/16*b^2*(-d*(c^2*x^2-1))^(1/2)*d/c/(c^2*x^2-1)*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*x^2-1/18*a*b*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)*x^6+7/48*a*b*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*
x^2+1)^(1/2)*x^4+1/8*a*b*(-d*(c^2*x^2-1))^(1/2)*d/c^2/(c^2*x^2-1)*arcsin(c*
x)*x-1/16*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arc
sin(c*x)^2*d-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)*x
^7+11/12*a*b*(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)*x^5-17/24
*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^3-7/1152*a*b*(-d*(c
^2*x^2-1))^(1/2)*d/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-1/48*b^2*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*d-1/6*b^2*(-d*(
c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)^2*x^7+11/24*b^2*(-d*(c^2*x^
2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)^2*x^5+1/16*b^2*(-d*(c^2*x^2-1))^(
1/2)*d/c^2/(c^2*x^2-1)*arcsin(c*x)^2*x-7/1152*b^2*(-d*(c^2*x^2-1))^(1/2)*d/
c^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-17/48*b^2*(-d*(c^2*x^2-1))^(
1/2)*d/(c^2*x^2-1)*arcsin(c*x)^2*x^3+1/108*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^4
/(c^2*x^2-1)*x^7-59/1728*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*x^5+7
/1152*b^2*(-d*(c^2*x^2-1))^(1/2)*d/c^2/(c^2*x^2-1)*x-1/6*a^2*x*(-c^2*d*x^2+
d)^(5/2)/c^2/d+1/24*a^2/c^2*x*(-c^2*d*x^2+d)^(3/2)+1/16*a^2/c^2*d*x*(-c^2*d
*x^2+d)^(1/2)+1/16*a^2/c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2))+65/3456*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*x^3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(a^2c^2dx^4 - a^2dx^2 + \left(b^2c^2dx^4 - b^2dx^2\right)\arcsin(cx)^2 + 2\left(abc^2dx^4 - abdx^2\right)\arcsin(cx)\right)\sqrt{-c^2dx^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^4 - a^2*d*x^2 + (b^2*c^2*d*x^4 - b^2*d*x^2)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*x^4 - a*b*d*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}} (b \arcsin(cx) + a)^2 x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^2, x)
```

3.220 $\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=279

$$\frac{2bc^3dx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{\left(d-c\right.}{}$$

```
[Out] (16*b^2*d*Sqrt[d - c^2*d*x^2])/(75*c^2) + (8*b^2*d*(1 - c^2*x^2)*Sqrt[d - c
^2*d*x^2])/(225*c^2) + (2*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c
^2) + (2*b*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x
^2]) - (4*b*c*d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c
^2*x^2]) + (2*b*c^3*d*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```

Rubi [A] time = 0.228064, antiderivative size = 279, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4677, 194, 4645, 12, 1247, 698}

$$\frac{2bc^3dx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{\left(d-c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (16*b^2*d*Sqrt[d - c^2*d*x^2])/(75*c^2) + (8*b^2*d*(1 - c^2*x^2)*Sqrt[d - c
^2*d*x^2])/(225*c^2) + (2*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c
^2) + (2*b*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x
^2]) - (4*b*c*d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c
^2*x^2]) + (2*b*c^3*d*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```


Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{5c^2d}+\frac{\left(2bd\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^2\left(a+b\right.}{5c\sqrt{1-c^2x^2}}$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+$$

$$=\frac{16b^2d\sqrt{d-c^2dx^2}}{75c^2}+\frac{8b^2d\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{225c^2}+\frac{2b^2d\left(1-c^2x^2\right)^2\sqrt{d-c^2}}{125c^2}$$

Mathematica [A] time = 0.179759, size = 159, normalized size = 0.57

$$\frac{2bd\sqrt{d-c^2dx^2}\left(15acx\left(3c^4x^4-10c^2x^2+15\right)+b\sqrt{1-c^2x^2}\left(9c^4x^4-38c^2x^2+149\right)+15bcx\left(3c^4x^4-10c^2x^2+15\right)\sin^{-}\right.}{1125c^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c^2*d) + (2*b*d*Sqrt[d -
c^2*d*x^2]*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(1
49 - 38*c^2*x^2 + 9*c^4*x^4) + 15*b*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4)*ArcSi
n[c*x]))/(1125*c^2*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.306, size = 1224, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/5*a^2/c^2/d*(-c^2*d*x^2+d)^(5/2)+b^2*(-1/4000*(-d*(c^2*x^2-1))^(1/2)*(16
*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcs
in(c*x)^2-2)*d/c^2/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^
2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arc
sin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(
c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c^2
/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1
))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x
*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/40
00*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2
-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1))+2*a*b*(-1/800
*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*
c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1
)*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)+1/96*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^
4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I
+3*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-
c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2
-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^2/(c^2*
x^2-1)+1/96*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^
4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2
-1)-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^
6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*
c^2*x^2-1)*(-I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1))
```

Maxima [A] time = 1.67837, size = 319, normalized size = 1.14

$$-\frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}b^2\arcsin\left(cx\right)^2}{5\,c^2d}+\frac{2}{1125}\,b^2\left(\frac{9\,\sqrt{-c^2x^2+1}c^2d^{\frac{5}{2}}x^4-38\,\sqrt{-c^2x^2+1}d^{\frac{5}{2}}x^2+\frac{149\,\sqrt{-c^2x^2+1}d^{\frac{5}{2}}}{c^2}}{d}+\frac{15\left(3\,c^4d^{\frac{5}{2}}x^5-1\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/5*(-c^2*d*x^2 + d)^(5/2)*b^2*arcsin(c*x)^2/(c^2*d) + 2/1125*b^2*((9*sqrt
(-c^2*x^2 + 1)*c^2*d^(5/2)*x^4 - 38*sqrt(-c^2*x^2 + 1)*d^(5/2)*x^2 + 149*sq
rt(-c^2*x^2 + 1)*d^(5/2)/c^2)/d + 15*(3*c^4*d^(5/2)*x^5 - 10*c^2*d^(5/2)*x^
3 + 15*d^(5/2)*x)*arcsin(c*x)/(c*d)) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a*b*arcsi
n(c*x)/(c^2*d) - 1/5*(-c^2*d*x^2 + d)^(5/2)*a^2/(c^2*d) + 2/75*(3*c^4*d^(5/
2)*x^5 - 10*c^2*d^(5/2)*x^3 + 15*d^(5/2)*x)*a*b/(c*d)
```

Fricas [A] time = 2.95549, size = 657, normalized size = 2.35

$$-\frac{30\left(3\,abc^5dx^5-10\,abc^3dx^3+15\,abcdx+\left(3\,b^2c^5dx^5-10\,b^2c^3dx^3+15\,b^2cdx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+\left(9\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/1125*(30*(3*a*b*c^5*d*x^5 - 10*a*b*c^3*d*x^3 + 15*a*b*c*d*x + (3*b^2*c^5
*d*x^5 - 10*b^2*c^3*d*x^3 + 15*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)
*sqrt(-c^2*x^2 + 1) + (9*(25*a^2 - 2*b^2)*c^6*d*x^6 - (675*a^2 - 94*b^2)*c^
4*d*x^4 + (675*a^2 - 374*b^2)*c^2*d*x^2 + 225*(b^2*c^6*d*x^6 - 3*b^2*c^4*d*
x^4 + 3*b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 - (225*a^2 - 298*b^2)*d + 450*
(a*b*c^6*d*x^6 - 3*a*b*c^4*d*x^4 + 3*a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sq
rt(-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}} (b \arcsin(cx) + a)^2 x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x, x)
```

3.221 $\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=305

$$\frac{bc^3dx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}-\frac{5bcdx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{3}{8}dx\sqrt{}$$

```
[Out] (-17*b^2*d*x*Sqrt[d - c^2*d*x^2])/64 + (b^2*c^2*d*x^3*Sqrt[d - c^2*d*x^2])/
32 + (17*b^2*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c*Sqrt[1 - c^2*x^2]) -
(5*b*c*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2])
 + (b*c^3*d*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^
2]) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/8 + (x*(d - c^2*d*x
^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^3)/(8*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.239648, antiderivative size = 307, normalized size of antiderivative = 1.01, number of steps used = 10, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4649, 4647, 4641, 4627, 321, 216, 4677, 195}

$$\frac{d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{8bc\sqrt{1-c^2x^2}}+\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{3}{8}dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{bd\left(1-c^2x^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-15*b^2*d*x*Sqrt[d - c^2*d*x^2])/64 - (b^2*d*x*(1 - c^2*x^2)*Sqrt[d - c^2*
d*x^2])/32 + (9*b^2*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c*Sqrt[1 - c^2*x
^2]) - (3*b*c*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^
2*x^2]) + (b*d*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(8*c) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/8 + (x*(d - c^2*
d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x])^3)/(8*b*c*Sqrt[1 - c^2*x^2])
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{4}(3d)\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

$$=\frac{bd\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c}+\frac{3}{8}dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)$$

$$=-\frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{3bcdx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{bd\left(1-\right.}{}$$

$$=-\frac{15}{64}b^2dx\sqrt{d-c^2dx^2}-\frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{3bcdx^2\sqrt{d-c^2dx^2}\left(a+\right.}{8\sqrt{1-c^2x^2}}$$

$$=-\frac{15}{64}b^2dx\sqrt{d-c^2dx^2}-\frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{9b^2d\sqrt{d-c^2dx^2}\sin^{-1}(c}{64c\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 1.11664, size = 329, normalized size = 1.08

$$\frac{d\sqrt{d-c^2dx^2}\left(-64a^2c^3x^3\sqrt{1-c^2x^2}+160a^2cx\sqrt{1-c^2x^2}+64ab\cos\left(2\sin^{-1}(cx)\right)+4ab\cos\left(4\sin^{-1}(cx)\right)-32b^2\sin\left(2\sin\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*Sqrt[1 - c^2*x
^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 8*b*d*Sqrt
[d - c^2*d*x^2]*ArcSin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcS
in[c*x]]) + d*Sqrt[d - c^2*d*x^2]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c
^3*x^3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c
*x]] - 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*Sqrt[d -
 c^2*d*x^2]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[c*x]] + 4
*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.243, size = 820, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/4*x*(-c^2*d*x^2+d)^(3/2)*a^2+3/8*a^2*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a^2*d^2
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-17/64*b^2*(-d*(
c^2*x^2-1))^(1/2)*d/c/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/8*b^2*(-
d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4+5
/8*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)*x^2-1/8*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsi
n(c*x)^3*d+1/32*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*x^5-19/64*b^2*
(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*x^3+17/64*b^2*(-d*(c^2*x^2-1))^(1/
2)*d/(c^2*x^2-1)*x-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(
c*x)^2*x^5+7/8*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)^2*x
```

```
^3-5/8*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)^2*x-1/8*a*b*(-d
*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4+5/8*a*b*(-d*(c
^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2-1/2*a*b*(-d*(c^2*x^
2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)*x^5+7/4*a*b*(-d*(c^2*x^2-1))^(1/2
)*d*c^2/(c^2*x^2-1)*arcsin(c*x)*x^3-17/64*a*b*(-d*(c^2*x^2-1))^(1/2)*d/c/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)-5/4*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*a
rcsin(c*x)*x-3/8*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1
)*arcsin(c*x)^2*d
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(a^2c^2dx^2 - a^2d + \left(b^2c^2dx^2 - b^2d\right)\arcsin\left(cx\right)^2 + 2\left(abc^2dx^2 - abd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

3.222 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx$

Optimal. Leaf size=545

$$\frac{2ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\cdots$$

```
[Out] (-22*b^2*d*Sqrt[d - c^2*d*x^2])/9 - (2*a*b*c*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] - (2*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/27 - (2*b^2*c*d*
x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*x*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^3*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^2 + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^
2)/3 - (2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2] - (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1
- c^2*x^2] + (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sq
rt[1 - c^2*x^2]
```

Rubi [A] time = 0.603579, antiderivative size = 545, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 12, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.414, Rules used = {4699, 4697, 4709, 4183, 2531, 2282, 6589, 4619, 261, 4645, 444, 43}

$$\frac{2ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ibd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```


```
[Out] (-22*b^2*d*Sqrt[d - c^2*d*x^2])/9 - (2*a*b*c*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] - (2*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/27 - (2*b^2*c*d*
x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*x*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^3*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^2 + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^
2)/3 - (2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2] - (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1
- c^2*x^2] + (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sq
rt[1 - c^2*x^2]
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
```

```
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
```

```
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + d\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx - \frac{(2}{}$$

$$= -\frac{2bcdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}} + c$$

$$= -\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-}}$$

$$= -\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cdx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}\left(a+b\,\mathrm{s}\right.}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{2b^2c}{}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{2b^2c}{}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{2b^2c}{}$$

Mathematica [A] time = 2.48199, size = 576, normalized size = 1.06

$$\frac{2abd\sqrt{d-c^2dx^2}\left(i\mathrm{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right) - i\mathrm{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right) + \sqrt{1-c^2x^2}\sin^{-1}(cx) - cx + \sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right.\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -(a^2*d*(-4 + c^2*x^2)*Sqrt[d - c^2*d*x^2])/3 + a^2*d^(3/2)*Log[c*x] - a^2*
d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*d*Sqrt[d - c^2*d*x^2]
*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[
c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin
[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b^2*d*Sqrt
[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2
]*ArcSin[c*x]^2 - ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*
ArcSin[c*x])]) - (2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLo
g[2, E^(I*ArcSin[c*x])]) + 2*(PolyLog[3, -E^(I*ArcSin[c*x])] - PolyLog[3, E
^(I*ArcSin[c*x])])))/Sqrt[1 - c^2*x^2] - (a*b*d*Sqrt[d - c^2*d*x^2]*(9*c*x
- 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin[c
*x]]))/(18*Sqrt[1 - c^2*x^2]) + (b^2*d*Sqrt[d - c^2*d*x^2]*(27*Sqrt[1 - c^2
*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] - 6*
ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.322, size = 1276, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)^2*l
n(1+I*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/(c^2*x^2-1)*d*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/3*b^2*(-d*(c^
2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)^2*x^4*c^4+5/3*b^2*(-d*(c^2*x^2-1)
)^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)^2*x^2*c^2+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2/9*a*
b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3*c^3+8/3*a*b*(
-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c-2*I*b^2*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*polylog(2,-I*c*
x-(-c^2*x^2+1)^(1/2))+2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*
x^2-1)*d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^
(1/2))-2/9*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*x^3*c^3+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-
1)*d*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+8/3*b^2*(-d*(c^2*x^2-1
))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x*c-2/3*a*b*(-d*(c^2*
x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4+10/3*a*b*(-d*(c^2*x^2-1))^(
1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2-2*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/(c^2*x^2-1)*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-a^2*d^(3/2
)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a^2*(-c^2*d*x^2+d)^(1/2)*d+68/
27*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)+1/3*(-c^2*d*x^2+d)^(3/2)*a^2+2/
27*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*c^4*x^4-70/27*b^2*(-d*(c^2*x^2-
1))^(1/2)*d/(c^2*x^2-1)*c^2*x^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/(c^2*x^2-1)*d*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*polylog(3,I*c*x+(-c^2*x^2+1)^(1/
2))-8/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)-4/3*b^2*(-d*(c
^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2dx^2-a^2d+\left(b^2c^2dx^2-b^2d\right)\arcsin\left(cx\right)^2+2\left(abc^2dx^2-abd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2/x, x)
```

3.223 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=424

$$-\frac{ib^2cd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{3bc^3dx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.$$

```
[Out] (b^2*c^2*d*x*Sqrt[d - c^2*d*x^2])/4 - (5*b^2*c*d*Sqrt[d - c^2*d*x^2]*ArcSin
[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]) - (3*c^2*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/2 - (I*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^
2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x - (c*d*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - (I*b^2*c*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt
[1 - c^2*x^2]
```

Rubi [A] time = 0.404278, antiderivative size = 424, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {4695, 4647, 4641, 4627, 321, 216, 4683, 4625, 3717, 2190, 2279, 2391, 195}

$$-\frac{ib^2cd\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{3bc^3dx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```


```
[Out] (b^2*c^2*d*x*Sqrt[d - c^2*d*x^2])/4 - (5*b^2*c*d*Sqrt[d - c^2*d*x^2]*ArcSin
[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]) - (3*c^2*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/2 - (I*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^
2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x - (c*d*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - (I*b^2*c*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt
[1 - c^2*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
```

```
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \left(3c^2d\right)\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2$$

$$= bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c$$

$$= -\frac{1}{2}b^2c^2dx\sqrt{d-c^2dx^2} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + bcd\sqrt{1-c^2x$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{b^2cd\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{2\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}\left(a+\right.}{2\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}\left(a+\right.}{2\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}\left(a+\right.}{2\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}\left(a+\right.}{2\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 2.41895, size = 396, normalized size = 0.93

$$-8b^2d\sqrt{d-c^2dx^2}\left(3icx\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)\left(3\sqrt{1-c^2x^2}\sin^{-1}(cx)+cx\left(\sin^{-1}(cx)+3i\right)\sin^{-1}(cx)-6c\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (-12*a^2*d*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*Sqrt[d - c^2*d*x^2] + 36*a^2*c*d
^(3/2)*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 +
c^2*x^2))] - 24*a*b*d*Sqrt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]
+ c*x*ArcSin[c*x]^2 - 2*c*x*Log[c*x]) - 8*b^2*d*Sqrt[d - c^2*d*x^2]*(ArcSin
[c*x]*(3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + c*x*ArcSin[c*x]*(3*I + ArcSin[c*x]
) - 6*c*x*Log[1 - E^((2*I)*ArcSin[c*x])]) + (3*I)*c*x*PolyLog[2, E^((2*I)*A
rcSin[c*x])]) - b^2*c*d*x*Sqrt[d - c^2*d*x^2]*(4*ArcSin[c*x]^3 + 6*ArcSin[c
*x]*Cos[2*ArcSin[c*x]] + (-3 + 6*ArcSin[c*x]^2)*Sin[2*ArcSin[c*x]]) - 6*a*b
*c*d*x*Sqrt[d - c^2*d*x^2]*(Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x]
 + Sin[2*ArcSin[c*x]])))/(24*x*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.324, size = 1148, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] 3/2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2
*d*c-1/2*a*b*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^
2-a*b*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)*x^3-a*b*(-d*(c^2
*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)*x-2*a*b*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d*c+2*I*
b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*polylog(2,I*c
*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(
1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arc
sin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^
3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+I*b^2*(-d*(c^2*x^2-1))^(1/
2)*d*c/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)-3/2*a^2*c^2*d*x*(-c^2*d
*x^2+d)^(1/2)-3/2*a^2*c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*
x^2+d)^(1/2))+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)
*arcsin(c*x)*d*c+b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2*d/(c^2*x^2-1)/x+1
/4*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*x^3-1/4*b^2*(-d*(c^2*x^2-1)
)^(1/2)*d*c^2/(c^2*x^2-1)*x-a^2*c^2*x*(-c^2*d*x^2+d)^(3/2)-a^2/d/x*(-c^2*d*
x^2+d)^(5/2)+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*
arcsin(c*x)^3*d*c+1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsi
n(c*x)^2*x^3-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)^2
*x+1/4*a*b*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+2*a*b*
(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*d/(c^2*x^2-1)/x
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2dx^2-a^2d+\left(b^2c^2dx^2-b^2d\right)\arcsin\left(cx\right)^2+2\left(abc^2dx^2-abd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\text{asin}\left(cx\right)\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2/x^2, x)
```

3.224 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx$

Optimal. Leaf size=590

$$-\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx\right.}{\sqrt{1-c^2x^2}}$$

```
[Out] 2*b^2*c^2*d*Sqrt[d - c^2*d*x^2] + (3*a*b*c^3*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] + (3*b^2*c^3*d*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2
*x^2] - (b*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2
]) - (b*c^3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2]
- (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - ((d - c^2*d*x^2)^
(3/2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d*S
qrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((3*I)*b
*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x]
)])/Sqrt[1 - c^2*x^2] + ((3*I)*b*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (3*b^2*c^2*d*Sqrt[d
- c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (3*b^2*c^2
*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.612378, antiderivative size = 590, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.517, Rules used = {4695, 4697, 4709, 4183, 2531, 2282, 6589, 4619, 261, 14, 4687, 446, 80, 63, 208}

$$-\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{3ibc^2d\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx\right.}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] 2*b^2*c^2*d*Sqrt[d - c^2*d*x^2] + (3*a*b*c^3*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] + (3*b^2*c^3*d*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2
*x^2] - (b*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2
]) - (b*c^3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2]
- (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - ((d - c^2*d*x^2)^
(3/2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d*S
qrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((3*I)*b
*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x]
)])/Sqrt[1 - c^2*x^2] + ((3*I)*b*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (3*b^2*c^2*d*Sqrt[d
- c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (3*b^2*c^2
*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
```

```
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^3}dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} - \frac{1}{2}\left(3c^2d\right)\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{x}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{3}{2}c$$

$$= \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}\left(\right.}{\sqrt{1-c}}$$

$$= -b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} -$$

$$= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{b}{}$$

$$= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{b}{}$$

$$= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{b}{}$$

Mathematica [A] time = 7.05624, size = 854, normalized size = 1.45

$$-\frac{3}{2}a^2d^{3/2}\log(x)c^2 + \frac{3}{2}a^2d^{3/2}\log\left(d+\sqrt{-d\left(c^2x^2-1\right)}\sqrt{d}\right)c^2 - 2abd\sqrt{d\left(1-c^2x^2\right)}\left(-\frac{cx}{\sqrt{1-c^2x^2}} + \sin^{-1}(cx) + \frac{\sin^{-1}(cx}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (-(a^2*c^2*d) - (a^2*d)/(2*x^2))*Sqrt[-(d*(-1 + c^2*x^2))] - (3*a^2*c^2*d^(
3/2)*Log[x])/2 + (3*a^2*c^2*d^(3/2)*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2)
)]])/2 - 2*a*b*c^2*d*Sqrt[d*(1 - c^2*x^2)]*(-((c*x)/Sqrt[1 - c^2*x^2]) + Ar
cSin[c*x] + (ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[
c*x])]))/Sqrt[1 - c^2*x^2] + (I*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2
, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]) - b^2*c^2*d*Sqrt[d*(1 - c^2*x^2)]
*(-2 - (2*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + ArcSin[c*x]^2 + (ArcSin[c*x]
^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*
x^2] + ((2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I
*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (2*(-PolyLog[3, -E^(I*ArcSin[c*x])] +
PolyLog[3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]) + (a*b*c^2*d^2*Sqrt[1 -
c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcS
in[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x]
)] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*
x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(4*Sqrt[d*
(1 - c^2*x^2)]) + (b^2*c^2*d^2*Sqrt[1 - c^2*x^2]*(-4*ArcSin[c*x]*Cot[ArcSin
[c*x]/2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]^2*Log[1 - E^(
I*ArcSin[c*x])] + 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[Ar
cSin[c*x]/2]] - (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (8*I)*Ar
cSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(I*ArcSin[c*x])]
- 8*PolyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*
ArcSin[c*x]*Tan[ArcSin[c*x]/2]))/(8*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] time = 0.398, size = 1372, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x)
```

```
[Out] -2*a*b*(-d*(c^2*x^2-1))^(1/2)*c^4*d/(c^2*x^2-1)*arcsin(c*x)*x^2+a*b*d*(-d*(
c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-2*a*b*(-d*(c^2*x^2-1))
^(1/2)*c^3*d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-2*b^2*(-d*(c^2*x^2-1))^(1/2)*
c^3*d/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x+b^2*d*arcsin(c*x)*(-d*(c
^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-3/2*b^2*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2
*x^2+1)^(1/2))+3/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2
*x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*a^2/d/x^2*(-c^2*d*
x^2+d)^(5/2)+3/2*a^2*c^2*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)
-3/2*a^2*c^2*(-c^2*d*x^2+d)^(1/2)*d-2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^2*d/(c^2
*x^2-1)+2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d/(c^2*x^2-1)*x^2+1/2*b^2*(-d*(c^2
*x^2-1))^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)^2+1/2*b^2*d*arcsin(c*x)^2*(-d*
(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)-6*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2
+1)^(1/2)*c^2*d/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+3*I*b^2*(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)*poly
log(2,-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-6
*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2)*arcsin(c
*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+6*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)*c^2*d/(2*c^2*x^2-2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+6*I*
a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2)*polylog(2
,-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*a^2*c^2*(-c^2*d*x^2+d)^(3/2)+2*b^2*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*arctanh(I*c*x+(-c^2*x^2
+1)^(1/2))-3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1
)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-d*(
c^2*x^2-1))^(1/2)*c^4*d/(c^2*x^2-1)*arcsin(c*x)^2*x^2+a*b*(-d*(c^2*x^2-1))^
(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)+a*b*d*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2
)/x^2/(c^2*x^2-1)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2dx^2 - a^2d + \left(b^2c^2dx^2 - b^2d\right)\arcsin\left(cx\right)^2 + 2\left(abc^2dx^2 - abd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2/x^3, x)
```

3.225 $\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx$

Optimal. Leaf size=400

$$\frac{4ib^2c^3d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{1-c^2x^2}}+\frac{c^3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{3b\sqrt{1-c^2x^2}}+\frac{4ic^3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{1-c^2x^2}}+\cdots$$

```
[Out] -(b^2*c^2*d*Sqrt[d - c^2*d*x^2])/(3*x) - (b^2*c^3*d*Sqrt[d - c^2*d*x^2]*Arc
Sin[c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2)/x + (((4*I)/3)*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/S
qrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) +
(c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) -
 (8*b*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin
[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((4*I)/3)*b^2*c^3*d*Sqrt[d - c^2*d*x^2]*P
olyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.554877, antiderivative size = 400, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4695, 4693, 4625, 3717, 2190, 2279, 2391, 4641, 4685, 277, 216}

$$\frac{4ib^2c^3d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{1-c^2x^2}}+\frac{c^3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{3b\sqrt{1-c^2x^2}}+\frac{4ic^3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{1-c^2x^2}}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -(b^2*c^2*d*Sqrt[d - c^2*d*x^2])/(3*x) - (b^2*c^3*d*Sqrt[d - c^2*d*x^2]*Arc
Sin[c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2)/x + (((4*I)/3)*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/S
qrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) +
(c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) -
 (8*b*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin
[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((4*I)/3)*b^2*c^3*d*Sqrt[d - c^2*d*x^2]*P
olyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
```

```
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4685

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcSin[c*x
]))/(f*(m + 1)), x] + (-Dist[(b*c*d^p)/(f*(m + 1)), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3x^3} - \left(c^2d\right)\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} + \frac{c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} + \frac{c^2d\sqrt{d-c^2d}}{}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a\right.}{3x^2}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a\right.}{3x^2}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a\right.}{3x^2}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a\right.}{3x^2}$$

Mathematica [A] time = 1.82012, size = 493, normalized size = 1.23

$$\frac{4ib^2c^3dx^3\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) - 3a^2c^3d^{3/2}x^3\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(c^2x^2-1\right)}\right) + 4a^2c^2dx^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (-(a*b*c*d*x*Sqrt[d - c^2*d*x^2]) - a^2*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2] + 4*a^2*c^2*d*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - b^2*c^2*d*x^
2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + b*d*Sqrt[d - c^2*d*x^2]*(3*a*c^3*
x^3 + b*((4*I)*c^3*x^3 - Sqrt[1 - c^2*x^2] + 4*c^2*x^2*Sqrt[1 - c^2*x^2]))*
ArcSin[c*x]^2 + b^2*c^3*d*x^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 3*a^2*c^3
*d^(3/2)*x^3*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-
1 + c^2*x^2))] - b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(b*c*x + 2*a*(1 - 4*c^
2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c^3*x^3*Log[1 - E^((2*I)*ArcSin[c*x])]) - 8*
a*b*c^3*d*x^3*Sqrt[d - c^2*d*x^2]*Log[c*x] + (4*I)*b^2*c^3*d*x^3*Sqrt[d - c
^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.388, size = 3281, normalized size = 8.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x)
```

```
[Out] -1/3*a^2/d/x^3*(-c^2*d*x^2+d)^(5/2)+2/3*a^2*c^4*x*(-c^2*d*x^2+d)^(3/2)+8*b^
2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^5+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-
9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3-8*I*b^2*(-d*(
c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(
1/2)*c^7+20/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(
c^2*x^2-1)*arcsin(c*x)*c^6+64*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^
2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-104*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(
24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+8*a*b*(-d*(c^2*x^2-
1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5
+146/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*
arcsin(c*x)*c^4-28/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/
x/(c^2*x^2-1)*arcsin(c*x)*c^2+3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-
9*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5-4/3*I*b^2*(-d*(c^2*x^2-
1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-16/3*I*b
^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin
(c*x)*c^8-a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(
c*x)^2*d*c^3-3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x
^2-1)*(-c^2*x^2+1)^(1/2)*c^3+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9
*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d*c^3-8*I*b^2
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d*c^3/(3*c^2*x^2-3)*polylog(2,-I
*c*x-(-c^2*x^2+1)^(1/2))+73/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^
2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)^2*c^4-14/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/
(24*c^4*x^4-9*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2-8*I*b^2*(-d*(c^2*x
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d*c^3/(3*c^2*x^2-3)*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-8*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)*d*c^3/(3*c^2*x^2-3)*arcsin(c*x)^2+8*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)*d*c^3/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2
))+8*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d*c^3/(3*c^2*x^2-3)*arcs
in(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+4/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24
*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-3*b^2*(-d*(c^2*x^2-1
))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*c^3+32*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x
^2-1)*arcsin(c*x)^2*c^8-52*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x
^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)^2*c^6-20/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(
24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+29/3*b^2*(-d*(c^2*x^2-1))^(1/2)
*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-10/3*b^2*(-d*(c^2*x^2-1))^(
1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+1/3*b^2*(-d*(c^2*x^2-1))^
(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x/(c^2*x^2-1)*c^2+1/3*b^2*(-d*(c^2*x^2-1))
^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)^2-1/3*b^2*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*d*c^3-16/3
*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-
c^2*x^2+1)*c^6+4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*
x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4+8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x
^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+32*I*b^2*(-d
*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)^
2*(-c^2*x^2+1)^(1/2)*c^7-16/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*
c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)*c^6-12*I*b^2*(-d*(c^2*x
^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2
*x^2+1)^(1/2)*c^5+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+
1)*x/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)*c^4+2/3*a^2*c^2/d/x*(-c^2*d*x^2+d
)^(5/2)+64*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4/(c^2
*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-24*I*a*b*(-d*(c^2*x^2-1))^(1/2)*
```

```
d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c
^5+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^2/(c^2*x^2-1
)*(-c^2*x^2+1)^(1/2)*c-16*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*d*c^3/(3*c^2*x^2-3)-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*
x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+20/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(2
4*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)
*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2
)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
*c+a^2*c^4*d*x*(-c^2*d*x^2+d)^(1/2)+a^2*c^4*d^2/(c^2*d)^(1/2)*arctan((c^2*d
)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2dx^2 - a^2d + \left(b^2c^2dx^2 - b^2d\right)\arcsin\left(cx\right)^2 + 2\left(abc^2dx^2 - abd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2 + d}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-d\left(cx - 1\right)\left(cx + 1\right)\right)^{\frac{3}{2}}\left(a + b\,\mathrm{asin}\left(cx\right)\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2/x^4, x)
```

3.226 $\int x^3 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=651

$$\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{81\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{441\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-c^2d}}{21\sqrt{}}$$

```
[Out] (160*b^2*d^2*Sqrt[d - c^2*d*x^2])/(3969*c^4) + (4*a*b*d^2*x*Sqrt[d - c^2*d*
x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (80*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d
*x^2])/(11907*c^4) + (4*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(1323*
c^4) + (50*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(27783*c^4) - (2*b^
2*d^2*(1 - c^2*x^2)^4*Sqrt[d - c^2*d*x^2])/(729*c^4) + (4*b^2*d^2*x*Sqrt[d
- c^2*d*x^2]*ArcSin[c*x])/(63*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d^2*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(189*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*x^
5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(21*Sqrt[1 - c^2*x^2]) + (38*b*c
^3*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(441*Sqrt[1 - c^2*x^2])
 - (2*b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(81*Sqrt[1 - c
^2*x^2]) - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^4) - (d^
2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^2) + (d^2*x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/21 + (5*d*x^4*(d - c^2*d*x^2)^(3/2)*(a
 + b*ArcSin[c*x])^2)/63 + (x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/9
```

Rubi [A] time = 1.24553, antiderivative size = 651, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 18, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.621, Rules used = {4699, 4697, 4707, 4677, 4619, 261, 4627, 266, 43, 14, 4687, 12, 446, 77, 270, 1251, 897, 1153}

$$\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{81\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{441\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-c^2d}}{21\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (160*b^2*d^2*Sqrt[d - c^2*d*x^2])/(3969*c^4) + (4*a*b*d^2*x*Sqrt[d - c^2*d*
x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (80*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d
*x^2])/(11907*c^4) + (4*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(1323*
c^4) + (50*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(27783*c^4) - (2*b^
2*d^2*(1 - c^2*x^2)^4*Sqrt[d - c^2*d*x^2])/(729*c^4) + (4*b^2*d^2*x*Sqrt[d
- c^2*d*x^2]*ArcSin[c*x])/(63*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d^2*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(189*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*x^
5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(21*Sqrt[1 - c^2*x^2]) + (38*b*c
^3*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(441*Sqrt[1 - c^2*x^2])
 - (2*b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(81*Sqrt[1 - c
^2*x^2]) - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^4) - (d^
2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^2) + (d^2*x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/21 + (5*d*x^4*(d - c^2*d*x^2)^(3/2)*(a
 + b*ArcSin[c*x])^2)/63 + (x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/9
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
```

```
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rubi steps

$$\int x^3 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx = \frac{1}{9}x^4 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{9}(5d) \int x^3 \left(d-c^2dx^2\right)^{3/2} \left(a+b\,\mathrm{si}\right.$$

$$= -\frac{2bcd^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{45\sqrt{1-c^2x^2}} + \frac{4bc^3d^2x^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.}{63\sqrt{1-c^2x^2}}$$

$$= -\frac{8bcd^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{105\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{441\sqrt{1-c^2x^2}}$$

$$= -\frac{2bcd^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{21\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{441\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{189c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{21\sqrt{1-c^2x^2}}$$

$$= \frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} + \frac{2bd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{189c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-}}{2}$$

$$= -\frac{134b^2d^2\sqrt{d-c^2dx^2}}{3969c^4} + \frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} + \frac{122b^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2d}}{11907c^4}$$

$$= \frac{160b^2d^2\sqrt{d-c^2dx^2}}{3969c^4} + \frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} + \frac{80b^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{11907c^4}$$

Mathematica [A] time = 0.41703, size = 270, normalized size = 0.41

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(3969a^2\left(7c^2x^2+2\right)\left(1-c^2x^2\right)^{7/2}+126abcx\left(49c^8x^8-171c^6x^6+189c^4x^4-21c^2x^2-126\right)+126b\sin^{-}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d^2*Sqrt[d - c^2*d*x^2]*(3969*a^2*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2) + 1
26*a*b*c*x*(-126 - 21*c^2*x^2 + 189*c^4*x^4 - 171*c^6*x^6 + 49*c^8*x^8) + 2
*b^2*Sqrt[1 - c^2*x^2]*(-6140 + 899*c^2*x^2 + 1005*c^4*x^4 - 1147*c^6*x^6 +
```

```
343*c^8*x^8) + 126*b*(63*a*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2) + b*c*x*(-1
26 - 21*c^2*x^2 + 189*c^4*x^4 - 171*c^6*x^6 + 49*c^8*x^8))*ArcSin[c*x] + 39
69*b^2*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2)*ArcSin[c*x]^2))/(250047*c^4*Sqrt
[1 - c^2*x^2])
```

Maple [C] time = 0.518, size = 2146, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] a^2*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2))+b
^2*(1/373248*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*
x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x
^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3
*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(18*I*arcsin(c*x)+81*arcsin(c*x)^2-2)*d^
2/c^4/(c^2*x^2-1)-3/175616*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-6
4*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5
-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(
14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)+1/1728*(-d*(c^2*x^
2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x
^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)-
3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c
*x)^2-2+2*I*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c
^4/(c^2*x^2-1)+1/1728*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^
3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arc
sin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)-3/175616*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c
^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6
*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c
-25*c^2*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)+1
/373248*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+256*c^10*x
^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)^(1/2)*x
^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I*(-c^2*x
^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-18*I*arcsin(c*x)+81*arcsin(c*x)^2-2)*d^2/c^
4/(c^2*x^2-1))+2*a*b*(1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8
*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*
x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2
*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d^2/c
^4/(c^2*x^2-1)-3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*
(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*
c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*
arcsin(c*x))*d^2/c^4/(c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*
c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*a
rcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c
^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x
^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^4/(
c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c
^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^4/(
c^2*x^2-1)-3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+
64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arc
sin(c*x))*d^2/c^4/(c^2*x^2-1)+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x
^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*
x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x
```

```
^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*
x))*d^2/c^4/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.46841, size = 1088, normalized size = 1.67

$$\frac{126\left(49\,abc^9d^2x^9-171\,abc^7d^2x^7+189\,abc^5d^2x^5-21\,abc^3d^2x^3-126\,abcd^2x+\left(49\,b^2c^9d^2x^9-171\,b^2c^7d^2x^7+189\,b^2c^5\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] 1/250047*(126*(49*a*b*c^9*d^2*x^9 - 171*a*b*c^7*d^2*x^7 + 189*a*b*c^5*d^2*x
^5 - 21*a*b*c^3*d^2*x^3 - 126*a*b*c*d^2*x + (49*b^2*c^9*d^2*x^9 - 171*b^2*c
^7*d^2*x^7 + 189*b^2*c^5*d^2*x^5 - 21*b^2*c^3*d^2*x^3 - 126*b^2*c*d^2*x)*ar
csin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + (343*(81*a^2 - 2*b^2)*
c^10*d^2*x^10 - 2*(51597*a^2 - 1490*b^2)*c^8*d^2*x^8 + 2*(67473*a^2 - 2152*
b^2)*c^6*d^2*x^6 - 4*(15876*a^2 - 53*b^2)*c^4*d^2*x^4 - (3969*a^2 - 14078*b
^2)*c^2*d^2*x^2 + 2*(3969*a^2 - 6140*b^2)*d^2 + 3969*(7*b^2*c^10*d^2*x^10 -
 26*b^2*c^8*d^2*x^8 + 34*b^2*c^6*d^2*x^6 - 16*b^2*c^4*d^2*x^4 - b^2*c^2*d^2
*x^2 + 2*b^2*d^2)*arcsin(c*x)^2 + 7938*(7*a*b*c^10*d^2*x^10 - 26*a*b*c^8*d^
2*x^8 + 34*a*b*c^6*d^2*x^6 - 16*a*b*c^4*d^2*x^4 - a*b*c^2*d^2*x^2 + 2*a*b*d
^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^2x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^3, x)
```

3.227 $\int x^2 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=556

$$-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{32\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{144\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.}{384\sqrt{1-c^2x^2}}$$

```
[Out] (-359*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/(36864*c^2) - (1079*b^2*d^2*x^3*Sqrt[d
 - c^2*d*x^2])/55296 + (209*b^2*c^2*d^2*x^5*Sqrt[d - c^2*d*x^2])/13824 - (b
^2*c^4*d^2*x^7*Sqrt[d - c^2*d*x^2])/256 + (359*b^2*d^2*Sqrt[d - c^2*d*x^2]*
ArcSin[c*x])/(36864*c^3*Sqrt[1 - c^2*x^2]) + (5*b*d^2*x^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/(128*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(384*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x
^6*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(144*Sqrt[1 - c^2*x^2]) - (b*c^
5*d^2*x^8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(32*Sqrt[1 - c^2*x^2]) -
 (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(128*c^2) + (5*d^2*x^3
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/64 + (5*d*x^3*(d - c^2*d*x^2)^(
3/2)*(a + b*ArcSin[c*x])^2)/48 + (x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2)/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(384*b*c^3*Sq
rt[1 - c^2*x^2])
```

Rubi [A] time = 1.10658, antiderivative size = 556, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 14, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.483, Rules used = {4699, 4697, 4707, 4641, 4627, 321, 216, 14, 4687, 12, 459, 266, 43, 1267}

$$-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{32\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{144\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.}{384\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-359*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/(36864*c^2) - (1079*b^2*d^2*x^3*Sqrt[d
 - c^2*d*x^2])/55296 + (209*b^2*c^2*d^2*x^5*Sqrt[d - c^2*d*x^2])/13824 - (b
^2*c^4*d^2*x^7*Sqrt[d - c^2*d*x^2])/256 + (359*b^2*d^2*Sqrt[d - c^2*d*x^2]*
ArcSin[c*x])/(36864*c^3*Sqrt[1 - c^2*x^2]) + (5*b*d^2*x^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/(128*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(384*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x
^6*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(144*Sqrt[1 - c^2*x^2]) - (b*c^
5*d^2*x^8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(32*Sqrt[1 - c^2*x^2]) -
 (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(128*c^2) + (5*d^2*x^3
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/64 + (5*d*x^3*(d - c^2*d*x^2)^(
3/2)*(a + b*ArcSin[c*x])^2)/48 + (x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2)/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(384*b*c^3*Sq
rt[1 - c^2*x^2])
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
```

```
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
```

```
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1267

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[(c^p*(f*x)^(m + 4*p - 1)*(d + e*x^2)^
(q + 1))/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1)), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rubi steps

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{8}x^3 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{8}(5d)\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}\right.$$

$$= -\frac{bcd^2x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{16\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{12\sqrt{1-c^2x^2}}$$

$$= -\frac{11bcd^2x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{96\sqrt{1-c^2x^2}} + \frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.}{144\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2} - \frac{59bcd^2x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{384\sqrt{1-c^2x^2}} + 17bc^3d^2$$

$$= -\frac{5}{512}b^2d^2x^3\sqrt{d-c^2dx^2} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} - \frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2}$$

$$= \frac{5b^2d^2x\sqrt{d-c^2dx^2}}{1024c^2} - \frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} - \frac{1}{25}$$

$$= -\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2} - \frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} -$$

$$= -\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2} - \frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} -$$

Mathematica [A] time = 0.463001, size = 348, normalized size = 0.63

$$\frac{d^2\sqrt{d-c^2dx^2}\left(3b\sin^{-1}(cx)\left(1440a^2+192abcx\sqrt{1-c^2x^2}\left(48c^6x^6-136c^4x^4+118c^2x^2-15\right)+b^2\left(-1152c^8x^8+4352c^6x^6\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(1440*a^3 - 96*a*b^2*c^2*x^2*(-45 + 177*c^2*x^2 -
136*c^4*x^4 + 36*c^6*x^6) + 288*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*
x^2 - 136*c^4*x^4 + 48*c^6*x^6) - b^3*c*x*Sqrt[1 - c^2*x^2]*(1077 + 2158*c^
2*x^2 - 1672*c^4*x^4 + 432*c^6*x^6) + 3*b*(1440*a^2 + 192*a*b*c*x*Sqrt[1 -
c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6) + b^2*(359 + 1440*c
^2*x^2 - 5664*c^4*x^4 + 4352*c^6*x^6 - 1152*c^8*x^8))*ArcSin[c*x] + 288*b^2
*(15*a + b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*
x^6))*ArcSin[c*x]^2 + 1440*b^3*ArcSin[c*x]^3))/(110592*b*c^3*Sqrt[1 - c^2*x
^2])
```

Maple [B] time = 0.571, size = 1375, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/8*a^2*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+5/192*a^2/c^2*d*x*(-c^2*d*x^2+d)^(3/2
)+5/128*a^2/c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)+1/48*a^2/c^2*x*(-c^2*d*x^2+d)^(5
/2)-5/128*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/c/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*x^2+59/384*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)*x^4-5/128*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c/(c^2*x^2-1)*(-c^2*x^2
+1)^(1/2)*x^2+1/4*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x
)*x^9-23/24*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)*x^7+
127/96*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*x^5+5/64*
a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c^2/(c^2*x^2-1)*arcsin(c*x)*x-5/128*a*b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/3
2*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^8-17/
144*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^6+1
/32*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)*x^8-17/144*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)*x^6+59/384*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1
)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4+1081/110592*b^2*(-d*(c^2*x^2-1))^(1/2)
*d^2/(c^2*x^2-1)*x^3+5/128*a^2/c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))-359/36864*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/c^3/(c^2*x^
2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-5/384*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*d^2+1/8*b^2*(-d*(c^2*x^2-1))^(1/
2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)^2*x^9-23/48*b^2*(-d*(c^2*x^2-1))^(1/2)*d
^2*c^4/(c^2*x^2-1)*arcsin(c*x)^2*x^7-133/192*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2
/(c^2*x^2-1)*arcsin(c*x)*x^3-359/36864*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/c^3/(
c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+127/192*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c
^2*x^2-1)*arcsin(c*x)^2*x^5+5/128*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/c^2/(c^2*x
^2-1)*arcsin(c*x)^2*x-133/384*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*ar
csin(c*x)^2*x^3-1/256*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*x^9+26
3/13824*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*x^7-1915/55296*b^2*(
-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*x^5+359/36864*b^2*(-d*(c^2*x^2-1)
)^(1/2)*d^2/c^2/(c^2*x^2-1)*x
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(a^2c^4d^2x^6 - 2\,a^2c^2d^2x^4 + a^2d^2x^2 + \left(b^2c^4d^2x^6 - 2\,b^2c^2d^2x^4 + b^2d^2x^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^4d^2x^6 - 2\,abc^2d^2x^4\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^6 - 2*a^2*c^2*d^2*x^4 + a^2*d^2*x^2 + (b^2*c^4*d^2*
x^6 - 2*b^2*c^2*d^2*x^4 + b^2*d^2*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^6 -
 2*a*b*c^2*d^2*x^4 + a*b*d^2*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^2x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^2, x)
```

3.228 $\int x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=382

$$-\frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{49\sqrt{1-c^2x^2}}+\frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{35\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{7\sqrt{1-c^2x^2}}$$

```
[Out] (32*b^2*d^2*Sqrt[d - c^2*d*x^2])/(245*c^2) + (16*b^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(735*c^2) + (12*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2
])/(1225*c^2) + (2*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^2) +
 (2*b*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c*Sqrt[1 - c^2*x^2]
) - (2*b*c*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*Sqrt[1 - c^2
*x^2]) + (6*b*c^3*d^2*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(35*Sqrt
[1 - c^2*x^2]) - (2*b*c^5*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
(49*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x])^2)/(7*c
^2*d)
```

Rubi [A] time = 0.292748, antiderivative size = 382, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4677, 194, 4645, 12, 1799, 1850}

$$-\frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{49\sqrt{1-c^2x^2}}+\frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{35\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{7\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (32*b^2*d^2*Sqrt[d - c^2*d*x^2])/(245*c^2) + (16*b^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(735*c^2) + (12*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2
])/(1225*c^2) + (2*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^2) +
 (2*b*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c*Sqrt[1 - c^2*x^2]
) - (2*b*c*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*Sqrt[1 - c^2
*x^2]) + (6*b*c^3*d^2*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(35*Sqrt
[1 - c^2*x^2]) - (2*b*c^5*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
(49*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x])^2)/(7*c
^2*d)
```


Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
```

```
Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1850

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)^2}{7c^2d}+\frac{\left(2bd^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^3\left(a+b\sin\right.}{7c\sqrt{1-c^2x^2}}$$

$$=\frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7\sqrt{1-c^2x^2}}+$$

$$=\frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7\sqrt{1-c^2x^2}}+$$

$$=\frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7\sqrt{1-c^2x^2}}+$$

$$=\frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7\sqrt{1-c^2x^2}}+$$

$$=\frac{32b^2d^2\sqrt{d-c^2dx^2}}{245c^2}+\frac{16b^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{735c^2}+\frac{12b^2d^2\left(1-c^2x^2\right)^2\sqrt{d-}}{1225c^2}$$

Mathematica [A] time = 0.324334, size = 216, normalized size = 0.57

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(3675a^2\left(1-c^2x^2\right)^{7/2}+210abcx\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)+210b\sin^{-1}(cx)\left(35a\left(1-c^2x^2\right)^{7/2}+bcx\right.\right.}{25725c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d^2*Sqrt[d - c^2*d*x^2]*(3675*a^2*(1 - c^2*x^2)^(7/2) + 210*a*b*c*x*(-35
+ 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + 2*b^2*Sqrt[1 - c^2*x^2]*(-2161 + 7
57*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 210*b*(35*a*(1 - c^2*x^2)^(7/2) +
b*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6))*ArcSin[c*x] + 3675*b^2*(
1 - c^2*x^2)^(7/2)*ArcSin[c*x]^2))/(25725*c^2*Sqrt[1 - c^2*x^2])
```

Maple [C] time = 0.402, size = 1888, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/7*a^2/c^2/d*(-c^2*d*x^2+d)^(7/2)+b^2*(1/43904*(-d*(c^2*x^2-1))^(1/2)*(64
*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^
2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2
*x^2+1)^(1/2)*x*c+1)*(14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2
-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(
1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)+1/384
*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3
+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c^2/
(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-
1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2
-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin
(c*x))*d^2/c^2/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin
(c*x)+9*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*
(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3
-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-10*I*arcsin(c*x)+25*
arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)+1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*I*(
-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c
^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x
*c-25*c^2*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)
)+2*a*b*(1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x
^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2
-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(
c*x))*d^2/c^2/(c^2*x^2-1)-1/640*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x
^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c
^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/12
8*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^
3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128
*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I
)*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*
c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+1/128*(-d*(c^2*x^2-1))^(1/
2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c
^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/640*(-d*(c^2*x^2-1))^(1/
2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*
c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*
d^2/c^2/(c^2*x^2-1)+1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*
x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*
x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(
-I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1))
```

Maxima [A] time = 1.6254, size = 379, normalized size = 0.99

$$-\frac{\left(-c^{2}dx^{2}+d\right)^{\frac{7}{2}}b^{2}\arcsin\left(cx\right)^{2}}{7\,c^{2}d}-\frac{2\left(-c^{2}dx^{2}+d\right)^{\frac{7}{2}}ab\arcsin\left(cx\right)}{7\,c^{2}d}-\frac{2}{25725}\,b^{2}\left(\frac{75\,\sqrt{-c^{2}x^{2}+1}c^{4}d^{\frac{7}{2}}x^{6}-351\,\sqrt{-c^{2}x^{2}+1}c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*(-c^2*d*x^2 + d)^(7/2)*b^2*arcsin(c*x)^2/(c^2*d) - 2/7*(-c^2*d*x^2 + d
)^(7/2)*a*b*arcsin(c*x)/(c^2*d) - 2/25725*b^2*((75*sqrt(-c^2*x^2 + 1)*c^4*d
^(7/2)*x^6 - 351*sqrt(-c^2*x^2 + 1)*c^2*d^(7/2)*x^4 + 757*sqrt(-c^2*x^2 + 1
)*d^(7/2)*x^2 - 2161*sqrt(-c^2*x^2 + 1)*d^(7/2)/c^2)/d + 105*(5*c^6*d^(7/2)
*x^7 - 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7/2)*x^3 - 35*d^(7/2)*x)*arcsin(c*x)/
(c*d)) - 1/7*(-c^2*d*x^2 + d)^(7/2)*a^2/(c^2*d) - 2/245*(5*c^6*d^(7/2)*x^7
- 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7/2)*x^3 - 35*d^(7/2)*x)*a*b/(c*d)
```

Fricas [A] time = 1.97908, size = 888, normalized size = 2.32

$$210\left(5\,abc^7d^2x^7 - 21\,abc^5d^2x^5 + 35\,abc^3d^2x^3 - 35\,abcd^2x + \left(5\,b^2c^7d^2x^7 - 21\,b^2c^5d^2x^5 + 35\,b^2c^3d^2x^3 - 35\,b^2cd^2x\right)\arcsin($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/25725*(210*(5*a*b*c^7*d^2*x^7 - 21*a*b*c^5*d^2*x^5 + 35*a*b*c^3*d^2*x^3 -
 35*a*b*c*d^2*x + (5*b^2*c^7*d^2*x^7 - 21*b^2*c^5*d^2*x^5 + 35*b^2*c^3*d^2*
x^3 - 35*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)
+ (75*(49*a^2 - 2*b^2)*c^8*d^2*x^8 - 12*(1225*a^2 - 71*b^2)*c^6*d^2*x^6 + 2
*(11025*a^2 - 1108*b^2)*c^4*d^2*x^4 - 4*(3675*a^2 - 1459*b^2)*c^2*d^2*x^2 +
 (3675*a^2 - 4322*b^2)*d^2 + 3675*(b^2*c^8*d^2*x^8 - 4*b^2*c^6*d^2*x^6 + 6*
b^2*c^4*d^2*x^4 - 4*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 7350*(a*b*c^
8*d^2*x^8 - 4*a*b*c^6*d^2*x^6 + 6*a*b*c^4*d^2*x^4 - 4*a*b*c^2*d^2*x^2 + a*b
*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{5}{2}}(b\arcsin(cx) + a)^2x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x, x)
```

3.229 $\int \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=438

$$\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{48bc\sqrt{1-c^2x^2}}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c$$

```
[Out] (-245*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/1152 - (65*b^2*d^2*x*(1 - c^2*x^2)*Sqr
t[d - c^2*d*x^2])/1728 - (b^2*d^2*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/10
8 + (115*b^2*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(1152*c*Sqrt[1 - c^2*x^2]
) - (5*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*Sqrt[1 - c^
2*x^2]) + (5*b*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(48*c) + (b*d^2*(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(18*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/16 + (5
*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/24 + (x*(d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^3)/(48*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.387097, antiderivative size = 438, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4649, 4647, 4641, 4627, 321, 216, 4677, 195}

$$\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^3}{48bc\sqrt{1-c^2x^2}}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-245*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/1152 - (65*b^2*d^2*x*(1 - c^2*x^2)*Sqr
t[d - c^2*d*x^2])/1728 - (b^2*d^2*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/10
8 + (115*b^2*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(1152*c*Sqrt[1 - c^2*x^2]
) - (5*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*Sqrt[1 - c^
2*x^2]) + (5*b*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(48*c) + (b*d^2*(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(18*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/16 + (5
*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/24 + (x*(d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^3)/(48*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
```

```
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{6}(5d)\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.$$

$$= \frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{18c}+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\,\mathrm{s}\right.$$

$$= -\frac{1}{108}b^2d^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}+\frac{5bd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{48c}$$

$$= -\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}-\frac{5bcd^2}{}$$

$$= -\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}-\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x\left(1-c^2\right.$$

$$= -\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}-\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x\left(1-c^2\right.$$

Mathematica [A] time = 1.81753, size = 407, normalized size = 0.93

$$\frac{d^2\left(\sqrt{d-c^2dx^2}\left(2304a^2c^5x^5\sqrt{1-c^2x^2}-7488a^2c^3x^3\sqrt{1-c^2x^2}+9504a^2cx\sqrt{1-c^2x^2}+3240ab\cos\left(2\sin^{-1}(cx)\right)+324\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(1440*b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 4320*a^2*Sqrt[d]*Sqrt[1
 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 12*
b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*Ar
cSin[c*x]] + 2*b*Cos[6*ArcSin[c*x]] + 540*a*Sin[2*ArcSin[c*x]] + 108*a*Sin[
4*ArcSin[c*x]] + 12*a*Sin[6*ArcSin[c*x]]) + 72*b*Sqrt[d - c^2*d*x^2]*ArcSin
[c*x]^2*(60*a + 45*b*Sin[2*ArcSin[c*x]] + 9*b*Sin[4*ArcSin[c*x]] + b*Sin[6*
ArcSin[c*x]]) + Sqrt[d - c^2*d*x^2]*(9504*a^2*c*x*Sqrt[1 - c^2*x^2] - 7488*
a^2*c^3*x^3*Sqrt[1 - c^2*x^2] + 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] + 3240*a
*b*Cos[2*ArcSin[c*x]] + 324*a*b*Cos[4*ArcSin[c*x]] + 24*a*b*Cos[6*ArcSin[c*
x]] - 1620*b^2*Sin[2*ArcSin[c*x]] - 81*b^2*Sin[4*ArcSin[c*x]] - 4*b^2*Sin[6
*ArcSin[c*x]])))/(13824*c*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.326, size = 1107, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/6*x*(-c^2*d*x^2+d)^(5/2)*a^2+1/6*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*
x^2-1)*arcsin(c*x)^2*x^7-17/24*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-
1)*arcsin(c*x)^2*x^5+59/48*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*a
rcsin(c*x)^2*x^3-5/48*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*
```

```
x^2-1)*arcsin(c*x)^3*d^2-299/1152*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/c/(c^2*x^2
-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-299/1152*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/
c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-11/8*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x
^2-1)*arcsin(c*x)*x+1/18*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)*x^6-13/48*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)*x^4+11/16*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)*x^2-5/16*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c
^2*x^2-1)*arcsin(c*x)^2*d^2+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2
-1)*arcsin(c*x)*x^7-17/12*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*ar
csin(c*x)*x^5+59/24*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c
*x)*x^3-13/48*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*x^4+11/16*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+1/18*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^
2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^6+5/24*a^2*d*x*(-c^2*d*x^2+d)^(3/
2)+5/16*a^2*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a^2*d^3/(c^2*d)^(1/2)*arctan((c
^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+299/1152*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2
/(c^2*x^2-1)*x-11/16*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)
^2*x-1/108*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*x^7+113/1728*b^2*
(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*x^5-1091/3456*b^2*(-d*(c^2*x^2-1
))^(1/2)*d^2*c^2/(c^2*x^2-1)*x^3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + abd^2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

3.230 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{x}\,dx$

Optimal. Leaf size=687

$$\frac{2ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-$$

```
[Out] (-598*b^2*d^2*Sqrt[d - c^2*d*x^2])/225 - (2*a*b*c*d^2*x*Sqrt[d - c^2*d*x^2]
)/Sqrt[1 - c^2*x^2] - (74*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/675 -
(2*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/125 - (2*b^2*c*d^2*x*Sqrt[d
 - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (16*b*c*d^2*x*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^2]) + (22*b*c^3*d^2*x^3*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*Sqrt[1 - c^2*x^2]) - (2*b*c^5*d^2*x
^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) + d^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 + (d*(d - c^2*d*x^2)^(3/2)*(a + b*A
rcSin[c*x])^2)/3 + ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/5 - (2*d^2
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt
[1 - c^2*x^2] + ((2*I)*b*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLo
g[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] -
(2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] + (2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[
1 - c^2*x^2]
```

Rubi [A] time = 0.885807, antiderivative size = 687, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 16, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.552, Rules used = {4699, 4697, 4709, 4183, 2531, 2282, 6589, 4619, 261, 4645, 444, 43, 194, 12, 1247, 698}

$$\frac{2ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ibd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x,x]
```


```
[Out] (-598*b^2*d^2*Sqrt[d - c^2*d*x^2])/225 - (2*a*b*c*d^2*x*Sqrt[d - c^2*d*x^2]
)/Sqrt[1 - c^2*x^2] - (74*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/675 -
(2*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/125 - (2*b^2*c*d^2*x*Sqrt[d
 - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (16*b*c*d^2*x*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^2]) + (22*b*c^3*d^2*x^3*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*Sqrt[1 - c^2*x^2]) - (2*b*c^5*d^2*x
^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) + d^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 + (d*(d - c^2*d*x^2)^(3/2)*(a + b*A
rcSin[c*x])^2)/3 + ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/5 - (2*d^2
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt
[1 - c^2*x^2] + ((2*I)*b*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLo
g[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] -
(2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] + (2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[
1 - c^2*x^2]
```


Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
```

```
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2 + d\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,d$$

$$= -\frac{2bcd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5\sqrt{1-c^2x^2}} + \frac{4bc^3d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.}{15\sqrt{1-c^2x^2}}$$

$$= -\frac{16bcd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.}{45\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{16bcd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{}}{}$$

$$= -\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cd^2x\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{16bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-}}$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx}$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx}$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx}$$

Mathematica [A] time = 4.53179, size = 775, normalized size = 1.13

$$\frac{d^2\left(-108000ab\sqrt{d-c^2dx^2}\left(-i\left(\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\right)-\sqrt{1-c^2x^2}\sin^{-1}(cx)+cx-\sin^{-1}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^2*(3600*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(23 - 11*c^2*x^2 + 3*c
^4*x^4) + 54000*a^2*Sqrt[d]*Sqrt[1 - c^2*x^2]*Log[c*x] - 54000*a^2*Sqrt[d]*
Sqrt[1 - c^2*x^2]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] - 108000*a*b*Sqrt[d
- c^2*d*x^2]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*(Log[1 - E^
(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) - I*(PolyLog[2, -E^(I*ArcSin
[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])])) - 54000*b^2*Sqrt[d - c^2*d*x^2]*(
2*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 -
 ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) -
(2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[
c*x])]) + 2*(PolyLog[3, -E^(I*ArcSin[c*x])] - PolyLog[3, E^(I*ArcSin[c*x])]
)) - 6000*a*b*Sqrt[d - c^2*d*x^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^
2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin[c*x]]) + 1000*b^2*Sqrt[d - c^2*d*x^
2]*(27*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[
3*ArcSin[c*x]] - 6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])) + 30*a*b*Sqrt[
d - c^2*d*x^2]*(450*c*x - 15*ArcSin[c*x]*(30*Sqrt[1 - c^2*x^2] + 5*Cos[3*Ar
cSin[c*x]] - 3*Cos[5*ArcSin[c*x]]) + 25*Sin[3*ArcSin[c*x]] - 9*Sin[5*ArcSin
[c*x]]) - b^2*Sqrt[d - c^2*d*x^2]*(6750*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]
^2) + 125*(-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] - 27*(-2 + 25*ArcSin[c*
x]^2)*Cos[5*ArcSin[c*x]] + 30*ArcSin[c*x]*(-25*Sin[3*ArcSin[c*x]] + 9*(-50*
c*x + Sin[5*ArcSin[c*x]])))))/(54000*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.415, size = 1574, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] -2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x
)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2/5*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^
2-1)*arcsin(c*x)*x^6*c^6-28/15*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*a
rcsin(c*x)*x^4*c^4+68/15*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(
c*x)*x^2*c^2+2/25*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(
1/2)*x^5*c^5+2/25*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*x^5*c^5-22/45*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*a
rcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^3*c^3+46/15*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/
(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x*c-2*I*b^2*(-d*(c^2*x^2-1))^(1/
2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d
^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*a*b*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))-22/45*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3*
c^3+46/15*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c
+2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x
)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/(c^2*x^2-1)*d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-46/15*a*b*(-d*
(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)-2/125*b^2*(-d*(c^2*x^2-1))^(
1/2)*d^2/(c^2*x^2-1)*c^6*x^6+532/3375*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x
^2-1)*c^4*x^4-9872/3375*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*c^2*x^2+
2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*polylog(3,-
I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
c^2*x^2-1)*d^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-23/15*b^2*(-d*(c^2*x^2-1
))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2+1/5*(-c^2*d*x^2+d)^(5/2)*a^2+1/3*a^2
*d*(-c^2*d*x^2+d)^(3/2)-a^2*d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))
/x)+a^2*(-c^2*d*x^2+d)^(1/2)*d^2+9394/3375*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(
c^2*x^2-1)+1/5*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^6
*c^6-14/15*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^4*c^4
+34/15*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^2*c^2+b^2
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)^2*ln
(1+I*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
(c^2*x^2-1)*d^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + a\right.\right.}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right) + a\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2/x, x)
```

3.231 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=561

$$-\frac{ib^2cd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.$$

```
[Out] (31*b^2*c^2*d^2*x*Sqrt[d - c^2*d*x^2])/64 + (b^2*c^2*d^2*x*(1 - c^2*x^2)*Sq
rt[d - c^2*d*x^2])/32 - (89*b^2*c*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*
Sqrt[1 - c^2*x^2]) + (15*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(8*Sqrt[1 - c^2*x^2]) + b*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]) - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 - (15*c^2*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^
2)/8 - (I*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2
] - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 - ((d - c^2*d
*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x - (5*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^3)/(8*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d^2*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2]
```

Rubi [A] time = 0.602778, antiderivative size = 561, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.517, Rules used = {4695, 4649, 4647, 4641, 4627, 321, 216, 4677, 195, 4683, 4625, 3717, 2190, 2279, 2391}

$$-\frac{ib^2cd^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```


```
[Out] (31*b^2*c^2*d^2*x*Sqrt[d - c^2*d*x^2])/64 + (b^2*c^2*d^2*x*(1 - c^2*x^2)*Sq
rt[d - c^2*d*x^2])/32 - (89*b^2*c*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*
Sqrt[1 - c^2*x^2]) + (15*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(8*Sqrt[1 - c^2*x^2]) + b*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]) - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 - (15*c^2*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^
2)/8 - (I*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2
] - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 - ((d - c^2*d
*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x - (5*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^3)/(8*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d^2*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
```

```
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \left(5c^2d\right)\int\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.$$

$$= \frac{1}{2}bcd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}\left(a+\right.$$

$$= -\frac{1}{8}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.$$

$$= -\frac{11}{16}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{15bc^3d^2x^2\sqrt{d-}}{8}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{11b^2cd^2\sqrt{d-c^2}}{16\sqrt{1-}}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{89b^2cd^2\sqrt{d-c^2}}{64\sqrt{1-}}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{89b^2cd^2\sqrt{d-c^2}}{64\sqrt{1-}}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{89b^2cd^2\sqrt{d-c^2}}{64\sqrt{1-}}$$

Mathematica [A] time = 2.07899, size = 586, normalized size = 1.04

$$\frac{d^2\left(-256ib^2cx\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+64a^2c^4x^4\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}-288a^2c^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^2*(-256*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - 288*a^2*c^2*x^2*Sqrt
[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 64*a^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sqrt[d
 - c^2*d*x^2] - 160*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 + 480*a^2*c*S
qrt[d]*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 +
c^2*x^2))] - 128*a*b*c*x*Sqrt[d - c^2*d*x^2]*Cos[2*ArcSin[c*x]] - 4*a*b*c*x
*Sqrt[d - c^2*d*x^2]*Cos[4*ArcSin[c*x]] + 512*a*b*c*x*Sqrt[d - c^2*d*x^2]*L
og[c*x] - (256*I)*b^2*c*x*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*
x])] + 64*b^2*c*x*Sqrt[d - c^2*d*x^2]*Sin[2*ArcSin[c*x]] + b^2*c*x*Sqrt[d -
 c^2*d*x^2]*Sin[4*ArcSin[c*x]] - 4*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(128*a
*Sqrt[1 - c^2*x^2] + 32*b*c*x*Cos[2*ArcSin[c*x]] + b*c*x*Cos[4*ArcSin[c*x]]
 - 128*b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])] + 64*a*c*x*Sin[2*ArcSin[c*x]] +
 4*a*c*x*Sin[4*ArcSin[c*x]]) - 8*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*(60*a*
c*x + (32*I)*b*c*x + 32*b*Sqrt[1 - c^2*x^2] + 16*b*c*x*Sin[2*ArcSin[c*x]] +
 b*c*x*Sin[4*ArcSin[c*x]])))/(256*x*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.411, size = 1446, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] 2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c
*d^2-a^2/d/x*(-c^2*d*x^2+d)^(7/2)-a^2*c^2*x*(-c^2*d*x^2+d)^(5/2)+1/8*b^2*(-
d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4
-9/8*b^2*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*x^2-2*b^2*(-d*(c^2*x^2-1))^(1/2)*c*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*
c*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1
/2))+I*b^2*(-d*(c^2*x^2-1))^(1/2)*c*d^2/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2
+1)^(1/2)+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*c*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*c*d^
2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/2*a*
b*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)*x^5-11/4*a*b*(-d*(
c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)*x^3+1/4*a*b*(-d*(c^2*x^2-
1))^(1/2)*c^2*d^2/(c^2*x^2-1)*arcsin(c*x)*x+15/8*a*b*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c*d^2+1/8*a*b*(-d*(c^2*x^2-1)
)^(1/2)*c^5*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-9/8*a*b*(-d*(c^2*x^2-1))
^(1/2)*c^3*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2-2*a*b*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c*d^2
-15/8*a^2*c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)
)+b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2*d^2/(c^2*x^2-1)/x-1/32*b^2*(-d*(
c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*x^5+35/64*b^2*(-d*(c^2*x^2-1))^(1/2)*
c^4*d^2/(c^2*x^2-1)*x^3-33/64*b^2*(-d*(c^2*x^2-1))^(1/2)*c^2*d^2/(c^2*x^2-1
)*x+33/64*a*b*(-d*(c^2*x^2-1))^(1/2)*c*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+2
*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*d^2/(c^2*x^2-1)/x+1/4*b^2*(-d*(c^2*
x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^5-11/8*b^2*(-d*(c^2*x^2-1
))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^3+1/8*b^2*(-d*(c^2*x^2-1))^(1/
2)*c^2*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x+5/8*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*c*d^2+33/64*b^2*(-d*(c^2*x^2-1))^(1
/2)*c*d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-15/8*a^2*c^2*d^2*x*(-c
^2*d*x^2+d)^(1/2)-5/4*a^2*c^2*d*x*(-c^2*d*x^2+d)^(3/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + abd^2\right.\right.}{x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2/x^2, x)
```

3.232 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx$

Optimal. Leaf size=740

$$-\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(c\right.}{\sqrt{1-c^2x^2}}$$

```
[Out] (40*b^2*c^2*d^2*Sqrt[d - c^2*d*x^2])/9 + (5*a*b*c^3*d^2*x*Sqrt[d - c^2*d*x^
2])/Sqrt[1 - c^2*x^2] + (2*b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/2
7 + (5*b^2*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (
b*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2]) - (b
*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) -
 (2*b*c^5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*
x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - (5*c^2*d*
(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/6 - ((d - c^2*d*x^2)^(5/2)*(a
+ b*ArcSin[c*x])^2)/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((5*I)*b*c^2*
d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])
/Sqrt[1 - c^2*x^2] + ((5*I)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (5*b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (5*b^2*c^
2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.955058, antiderivative size = 740, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 20, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.69, Rules used = {4695, 4699, 4697, 4709, 4183, 2531, 2282, 6589, 4619, 261, 4645, 444, 43, 270, 4687, 12, 1251, 897, 1153, 208}

$$-\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(c\right.}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (40*b^2*c^2*d^2*Sqrt[d - c^2*d*x^2])/9 + (5*a*b*c^3*d^2*x*Sqrt[d - c^2*d*x^
2])/Sqrt[1 - c^2*x^2] + (2*b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/2
7 + (5*b^2*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (
b*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2]) - (b
*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) -
 (2*b*c^5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*
x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - (5*c^2*d*
(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/6 - ((d - c^2*d*x^2)^(5/2)*(a
+ b*ArcSin[c*x])^2)/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((5*I)*b*c^2*
d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])
/Sqrt[1 - c^2*x^2] + ((5*I)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (5*b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (5*b^2*c^
2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{x^3}dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{2x^2} - \frac{1}{2}(5c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx)}{x}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{2bc^3d^2x\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}} + \frac{bc}{}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{3\sqrt{1-c^2x^2}} - \frac{2bc}{}$$

$$= \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(}{3\sqrt{1-c}}$$

$$= \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{d-c^2dx^2}(a+b}{x\sqrt{1-c^2x^2}}$$

$$= \frac{55}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{5}{27}b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}$$

$$= \frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{2}{27}b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}$$

$$= \frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{2}{27}b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}$$

Mathematica [A] time = 7.19269, size = 1073, normalized size = 1.45

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*((-7*a^2*c^2*d^2)/3 - (a^2*d^2)/(2*x^2) + (a^2*c^
4*d^2*x^2)/3) - (5*a^2*c^2*d^(5/2)*Log[x])/2 + (5*a^2*c^2*d^(5/2)*Log[d + S
qrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/2 - 4*a*b*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*
(-((c*x)/Sqrt[1 - c^2*x^2]) + ArcSin[c*x] + (ArcSin[c*x]*(Log[1 - E^(I*ArcS
in[c*x])] - Log[1 + E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (I*(PolyLog[2,
 -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]) -
 2*b^2*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(-2 - (2*c*x*ArcSin[c*x])/Sqrt[1 - c^2
*x^2] + ArcSin[c*x]^2 + (ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1
+ E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + ((2*I)*ArcSin[c*x]*(PolyLog[2, -
E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (2
*(-PolyLog[3, -E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])]))/Sqrt[1
- c^2*x^2]) - (a*b*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(-9*c*x + 9*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - Sin[3*ArcSin[c*x]]))/(
18*Sqrt[1 - c^2*x^2]) - (b^2*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(27*Sqrt[1 - c^2
*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] - 6*
ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108*Sqrt[1 - c^2*x^2]) + (a*b*c
^2*d^3*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*
x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 +
```

```
E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2
, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]
/2]))/(4*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*d^3*Sqrt[1 - c^2*x^2]*(-4*ArcSin
[c*x]*Cot[ArcSin[c*x]/2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*
x]^2*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])
] + 8*Log[Tan[ArcSin[c*x]/2]] - (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c
*x])] + (8*I)*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(
I*ArcSin[c*x])] - 8*PolyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSi
n[c*x]/2]^2 - 4*ArcSin[c*x]*Tan[ArcSin[c*x]/2]))/(8*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] time = 0.481, size = 1674, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x)
```

```
[Out] -14/3*b^2*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)*x+b^2*d^2*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x
^2+1)^(1/2)*c+2/9*b^2*(-d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1)*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)*x^3+2/9*a*b*(-d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*x^3-14/3*a*b*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*x+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*ar
csin(c*x)*x^4-16/3*a*b*(-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*
x)*x^2+a*b*d^2*(-d*(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-5/
2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(c^2*x^2-1)*arcsin(
c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+5/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)*c^2*d^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))+a*b*d^2*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)+11/3*a*b*(-d*
(c^2*x^2-1))^(1/2)*c^2*d^2/(c^2*x^2-1)*arcsin(c*x)+2*b^2*(-d*(c^2*x^2-1))^(
1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(c^2*x^2-1)*arctanh(I*c*x+(-c^2*x^2+1)^(1/2
))-5*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(c^2*x^2-1)*poly
log(3,-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*a^2/d/x^2*(-c^2*d*x^2+d)^(7/2)-5/6*a^2
*c^2*d*(-c^2*d*x^2+d)^(3/2)+5/2*a^2*c^2*d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x
^2+d)^(1/2))/x)-5/2*a^2*c^2*(-c^2*d*x^2+d)^(1/2)*d^2-122/27*b^2*(-d*(c^2*x^
2-1))^(1/2)*c^2*d^2/(c^2*x^2-1)-10*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)*c^2*d^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+10*a
*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*arcsin(c
*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2
+1)^(1/2)*c^2*d^2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/
2))-5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(c^2*x^2-1)*a
rcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+10*I*a*b*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*polylog(2,-I*c*x-(-c^2*x^2+1)^
(1/2))-10*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^
2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/2*a^2*c^2*(-c^2*d*x^2+d)^(5/2)+5
*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(c^2*x^2-1)*polylog(
3,I*c*x+(-c^2*x^2+1)^(1/2))+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2
-1)*arcsin(c*x)^2*x^4-8/3*b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*ar
csin(c*x)^2*x^2-2/27*b^2*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*x^4+124
/27*b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*x^2+11/6*b^2*(-d*(c^2*x^
2-1))^(1/2)*c^2*d^2/(c^2*x^2-1)*arcsin(c*x)^2+1/2*b^2*d^2*arcsin(c*x)^2*(-d
*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + abd^2\right.\right.}{x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right) + a\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2/x^3, x)
```

3.233 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx$

Optimal. Leaf size=591

$$\frac{7ib^2c^3d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{1-c^2x^2}}-\frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.$$

```
[Out] (-7*b^2*c^4*d^2*x*Sqrt[d - c^2*d*x^2])/12 - (b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(3*x) + (23*b^2*c^3*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(
12*Sqrt[1 - c^2*x^2]) - (5*b*c^5*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(2*Sqrt[1 - c^2*x^2]) - (7*b*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/2 + (((7*I)/3)*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2)/Sqrt[1 - c^2*x^2] + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x])^2)/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) + (5*
c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*Sqrt[1 - c^2*x^2])
- (14*b*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((7*I)/3)*b^2*c^3*d^2*Sqrt[d - c^2*d*
x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.883494, antiderivative size = 591, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.517, Rules used = {4695, 4647, 4641, 4627, 321, 216, 4683, 4625, 3717, 2190, 2279, 2391, 195, 4685, 277}

$$\frac{7ib^2c^3d^2\sqrt{d-c^2dx^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{1-c^2x^2}}-\frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```


```
[Out] (-7*b^2*c^4*d^2*x*Sqrt[d - c^2*d*x^2])/12 - (b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(3*x) + (23*b^2*c^3*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(
12*Sqrt[1 - c^2*x^2]) - (5*b*c^5*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(2*Sqrt[1 - c^2*x^2]) - (7*b*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/2 + (((7*I)/3)*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2)/Sqrt[1 - c^2*x^2] + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x])^2)/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) + (5*
c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*Sqrt[1 - c^2*x^2])
- (14*b*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((7*I)/3)*b^2*c^3*d^2*Sqrt[d - c^2*d*
x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
```

```
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 4685

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcSin[c*x
]))/(f*(m + 1)), x] + (-Dist[(b*c*d^p)/(f*(m + 1)), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{x^4}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3x^3} - \frac{1}{3}(5c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx)}{x^2}$$

$$= -\frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{3x^2} + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\sin}{3x}$$

$$= -\frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))$$

$$= \frac{2}{3}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} - \frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{2b^2c^3d^2\sqrt{d-c^2dx^2}\,\mathrm{si}}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\,\mathrm{s}}{12\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\,\mathrm{s}}{12\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\,\mathrm{s}}{12\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 3.56288, size = 690, normalized size = 1.17

$$\frac{d^2\left(28ib^2c^3x^3\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+6a^2c^4x^4\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}+28a^2c^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}-4a^2\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d^2*(-4*a*b*c*x*Sqrt[d - c^2*d*x^2] + 3*a*b*c^3*x^3*Sqrt[d - c^2*d*x^2] -
6*a*b*c^5*x^5*Sqrt[d - c^2*d*x^2] - 4*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2] + 28*a^2*c^2*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - 4*b^2*c^2*x^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 6*a^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sq
rt[d - c^2*d*x^2] - 3*b^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 1
0*b^2*c^3*x^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 30*a^2*c^3*Sqrt[d]*x^3*Sq
rt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))]
 - 56*a*b*c^3*x^3*Sqrt[d - c^2*d*x^2]*Log[c*x] + (28*I)*b^2*c^3*x^3*Sqrt[d -
 c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])] + b*Sqrt[d - c^2*d*x^2]*ArcSi
n[c*x]*(-4*b*c*x - 6*a*Sqrt[1 - c^2*x^2] + 48*a*c^2*x^2*Sqrt[1 - c^2*x^2] +
 3*b*c^3*x^3*Cos[2*ArcSin[c*x]] - 2*a*Cos[3*ArcSin[c*x]] - 56*b*c^3*x^3*Log
[1 - E^((2*I)*ArcSin[c*x])] + 6*a*c^3*x^3*Sin[2*ArcSin[c*x]]) + b*Sqrt[d -
c^2*d*x^2]*ArcSin[c*x]^2*(30*a*c^3*x^3 + 4*b*((7*I)*c^3*x^3 - Sqrt[1 - c^2*
x^2] + 7*c^2*x^2*Sqrt[1 - c^2*x^2]) + 3*b*c^3*x^3*Sin[2*ArcSin[c*x]])))/(12
*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] time = 0.465, size = 3855, normalized size = 6.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x)
```

```
[Out] 4/3*a^2*c^2/d/x*(-c^2*d*x^2+d)^(7/2)+5/3*a^2*c^4*d*x*(-c^2*d*x^2+d)^(3/2)+5
/2*a^2*c^4*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1
47*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-
1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^7-49/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d
^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)*c^6-3
5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1
)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2
/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)*c^4-1/4*a
*b*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-1/4*b^2*(-
d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/2
*b^2*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^3-1/2*b^2*(
-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x-56/3*b^2*(-d*(c^2
*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+71/3*b^2*(
-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-16/
3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*c^
4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*x^2-1
)*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^3/(c^2
*x^2-1)*arcsin(c*x)^2-5/6*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^
2*x^2-1)*arcsin(c*x)^3*c^3*d^2+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x
^4-15*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+14/3*a*b*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^3*d^2
-5*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)*c^3+a*b*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c
*x)*x^3-a*b*(-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)*x+14*b^2
*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*arcsin(c*x
)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^
2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+7/3*b^2*(-d*(c^2*x^2-1))^(1/2)*
d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-1/3*I*b^2*(-
d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)
^(1/2)*c^3-14*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^
2*x^2-3)*arcsin(c*x)^2-14*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c
^3*d^2/(3*c^2*x^2-3)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-14*I*b^2*(-c^2*x^
2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))+1/2*a*b*(-d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1)*(-c^2*x
^2+1)^(1/2)*x^2-5/2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-
1)*arcsin(c*x)^2*c^3*d^2-5*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^
2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3-23/3*b^2*(-d*(c^2*x
^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2+
147*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1
)*arcsin(c*x)^2*c^8-203*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x
^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)^2*c^6+190/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^
2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)^2*c^4+14*b^2*(-c^2*x^
2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*
c*x+(-c^2*x^2+1)^(1/2))-49/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-1
5*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+7/3*I*a*b*(-d*(c^2*x^2-1))^(1
/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4+14/3*I*a*b
*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*c^3+294*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-
15*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-70*I*a*b*(
-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^5+5/2*a^2*c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)-1/3*a^2/
d/x^3*(-c^2*d*x^2+d)^(7/2)+4/3*a^2*c^4*x*(-c^2*d*x^2+d)^(5/2)+294*a*b*(-d*(
c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)
*c^8-406*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*
x^2-1)*arcsin(c*x)*c^6+21*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2
```

```
*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+380/3*a*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-46/3*a*b*(
-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*
x)*c^2+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^2/(c^
2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+21*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4
-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5-7/3*I*b^2
*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(
c*x)*c^4+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^
2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3-49/3*I*b^2*(-d*(c^2*x^2-1))^(
1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-21*I*b^2
*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)*c^7+56/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*
x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(
63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+1/3*b^2*(-d
*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*c-28*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*
arcsin(c*x)*c^3*d^2/(3*c^2*x^2-3)-49/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63
*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+56/3*I*a*b*(-d*(c^2*x^2-1))^(1/2
)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-7/3*I*a*b*(-d*(c^2*x^2-
1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*c^4-1/4*b^2*(-d*(c^2*
x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*x^3+1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d^
2/(c^2*x^2-1)*x
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + abd^2\right.}{x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2/x^4, x)
```

3.234 $\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=400

$$\frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{2bx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{25c\sqrt{d-c^2dx^2}}-\frac{x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{5c^2d}+\frac{8bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{45c^3\sqrt{d-c^2dx^2}}$$

```
[Out] (16*a*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (298*b^2*(1 - c
^2*x^2))/(225*c^6*Sqrt[d - c^2*d*x^2]) - (76*b^2*(1 - c^2*x^2)^2)/(675*c^6*
Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^3)/(125*c^6*Sqrt[d - c^2*d*x^2]
) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(15*c^5*Sqrt[d - c^2*d*x^2]) +
 (8*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3*Sqrt[d - c^2*d*x^2
]) + (2*b*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c*Sqrt[d - c^2*d*x
^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^6*d) - (4*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4*d) - (x^4*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```

Rubi [A] time = 0.583019, antiderivative size = 400, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4707, 4677, 4619, 261, 4627, 266, 43}

$$\frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{2bx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{25c\sqrt{d-c^2dx^2}}-\frac{x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{5c^2d}+\frac{8bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{45c^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```


```
[Out] (16*a*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (298*b^2*(1 - c
^2*x^2))/(225*c^6*Sqrt[d - c^2*d*x^2]) - (76*b^2*(1 - c^2*x^2)^2)/(675*c^6*
Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^3)/(125*c^6*Sqrt[d - c^2*d*x^2]
) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(15*c^5*Sqrt[d - c^2*d*x^2]) +
 (8*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3*Sqrt[d - c^2*d*x^2
]) + (2*b*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c*Sqrt[d - c^2*d*x
^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^6*d) - (4*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4*d) - (x^4*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```


Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
```

```
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{5c^2d}+\frac{4\int\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{5c^2}+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int x^4\left(a+b\right.}{5c\sqrt{d-c^2dx^2}}$$

$$=\frac{2bx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{25c\sqrt{d-c^2dx^2}}-\frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{15c^4d}-\frac{x^4\sqrt{d-c^2dx^2}\left(a\right.}{5c^2}$$

$$=\frac{8bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{45c^3\sqrt{d-c^2dx^2}}+\frac{2bx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{25c\sqrt{d-c^2dx^2}}-\frac{8\sqrt{d-c^2dx^2}\left(a+\right.}{15c^6d}$$

$$=\frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{8bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{45c^3\sqrt{d-c^2dx^2}}+\frac{2bx^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{25c\sqrt{d-c^2dx^2}}-$$

$$=\frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{2b^2\left(1-c^2x^2\right)}{25c^6\sqrt{d-c^2dx^2}}-\frac{4b^2\left(1-c^2x^2\right)^2}{75c^6\sqrt{d-c^2dx^2}}+\frac{2b^2\left(1-c^2x^2\right)^3}{125c^6\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{1-}}{15c^5}$$

$$=\frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{298b^2\left(1-c^2x^2\right)}{225c^6\sqrt{d-c^2dx^2}}-\frac{76b^2\left(1-c^2x^2\right)^2}{675c^6\sqrt{d-c^2dx^2}}+\frac{2b^2\left(1-c^2x^2\right)^3}{125c^6\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{}}{15c}$$

Mathematica [A] time = 0.168043, size = 230, normalized size = 0.57

$$\frac{225a^2\left(3c^6x^6+c^4x^4+4c^2x^2-8\right)+30abcx\sqrt{1-c^2x^2}\left(9c^4x^4+20c^2x^2+120\right)+30b\sin^{-1}(cx)\left(15a\left(3c^6x^6+c^4x^4+4c^2x^2\right.\right.}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (30*a*b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4*x^4) + 225*a^2*(-8
+ 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6) - 2*b^2*(-2072 + 1936*c^2*x^2 + 109*c^4*
x^4 + 27*c^6*x^6) + 30*b*(b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4
*x^4) + 15*a*(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6))*ArcSin[c*x] + 225*b^2*
(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6)*ArcSin[c*x]^2)/(3375*c^6*Sqrt[d - c^
2*d*x^2])
```

Maple [C] time = 0.597, size = 1304, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] a^2*(-1/5*x^4/c^2/d*(-c^2*d*x^2+d)^(1/2)+4/5/c^2*(-1/3*x^2/c^2/d*(-c^2*d*x^
2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2)))+b^2*(-1/4000*(-d*(c^2*x^2-1))^(
1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I
*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(c*x)
+25*arcsin(c*x)^2-2)/c^6/d/(c^2*x^2-1)-5/864*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*
x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*
(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))
^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x
))/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+
c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^6/d/(c^2*x^2-1)-5/864*(-d*(c
^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)
^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^6/d/(c^2*x^2
-1)-1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x
^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13
*c^2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^6/d/(c^2*x^2-1))+2*a*b
*(-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1
/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/
2)*x*c-1)*(I+5*arcsin(c*x))/c^6/d/(c^2*x^2-1)-5/288*(-d*(c^2*x^2-1))^(1/2)*
(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*
x*c+1)*(I+3*arcsin(c*x))/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2
*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^6/d/(c^2*x^2-1)-5/16*(-d
*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^
6/d/(c^2*x^2-1)-5/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^
3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^6/
d/(c^2*x^2-1)-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5
+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/
2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))/c^6/d/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.00462, size = 628, normalized size = 1.57

$$-\frac{30\left(9\,abc^5x^5+20\,abc^3x^3+120\,abcx+\left(9\,b^2c^5x^5+20\,b^2c^3x^3+120\,b^2cx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+\left(27\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] -1/3375*(30*(9*a*b*c^5*x^5 + 20*a*b*c^3*x^3 + 120*a*b*c*x + (9*b^2*c^5*x^5
+ 20*b^2*c^3*x^3 + 120*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2
*x^2 + 1) + (27*(25*a^2 - 2*b^2)*c^6*x^6 + (225*a^2 - 218*b^2)*c^4*x^4 + 4*
(225*a^2 - 968*b^2)*c^2*x^2 + 225*(3*b^2*c^6*x^6 + b^2*c^4*x^4 + 4*b^2*c^2*
x^2 - 8*b^2)*arcsin(c*x)^2 - 1800*a^2 + 4144*b^2 + 450*(3*a*b*c^6*x^6 + a*b
*c^4*x^4 + 4*a*b*c^2*x^2 - 8*a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^8*d
*x^2 - c^6*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2x^5}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^5/sqrt(-c^2*d*x^2 + d), x)
```

3.235 $\int \frac{x^4(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=337

$$\frac{bx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{d-c^2dx^2}}-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d}+\frac{3bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c^3\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\left(a\right.}{8c^4}$$

```
[Out] (15*b^2*x*(1 - c^2*x^2))/(64*c^4*Sqrt[d - c^2*d*x^2]) + (b^2*x^3*(1 - c^2*x
^2))/(32*c^2*Sqrt[d - c^2*d*x^2]) - (15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/
(64*c^5*Sqrt[d - c^2*d*x^2]) + (3*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(8*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x]))/(8*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*c^2*d)
 + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(8*b*c^5*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.484204, antiderivative size = 337, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {4707, 4643, 4641, 4627, 321, 216}

$$\frac{bx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{d-c^2dx^2}}-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d}+\frac{3bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c^3\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\left(a\right.}{8c^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```



```
[Out] (15*b^2*x*(1 - c^2*x^2))/(64*c^4*Sqrt[d - c^2*d*x^2]) + (b^2*x^3*(1 - c^2*x
^2))/(32*c^2*Sqrt[d - c^2*d*x^2]) - (15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/
(64*c^5*Sqrt[d - c^2*d*x^2]) + (3*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(8*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x]))/(8*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*c^2*d)
 + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(8*b*c^5*Sqrt[d - c^2*d*x^2])
```


Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
```

```
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{4c^2d} + \frac{3\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{4c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x^3\left(a+b\sin\right.}{2c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{8c^4d} - \frac{x^3\sqrt{d-c^2dx^2}\left(a+\right.}{4c^2d}$$

$$= \frac{b^2x^3\left(1-c^2x^2\right)}{32c^2\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{d-c^2dx^2}} -$$

$$= \frac{15b^2x\left(1-c^2x^2\right)}{64c^4\sqrt{d-c^2dx^2}} + \frac{b^2x^3\left(1-c^2x^2\right)}{32c^2\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}}{8c\sqrt{d}}$$

$$= \frac{15b^2x\left(1-c^2x^2\right)}{64c^4\sqrt{d-c^2dx^2}} + \frac{b^2x^3\left(1-c^2x^2\right)}{32c^2\sqrt{d-c^2dx^2}} - \frac{15b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{64c^5\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}\left(a+b\right.}{8c^3\sqrt{d-c^2dx}}$$

Mathematica [A] time = 1.3866, size = 283, normalized size = 0.84

$$32a^2c\sqrt{d}x\left(c^2x^2-1\right)\left(2c^2x^2+3\right) - 96a^2\sqrt{d-c^2dx^2}\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(c^2x^2-1\right)}\right) - 4ab\sqrt{d}\sqrt{1-c^2x^2}\left(-4\sin^{-1}(cx)\left(6\sin^{-1}(cx)-\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (32*a^2*c*Sqrt[d]*x*(-1 + c^2*x^2)*(3 + 2*c^2*x^2) - 96*a^2*Sqrt[d - c^2*d*
x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b^2*Sqrt[
d]*Sqrt[1 - c^2*x^2]*(32*ArcSin[c*x]^3 + 4*ArcSin[c*x]*(-16*Cos[2*ArcSin[c*
x]] + Cos[4*ArcSin[c*x]]) + 32*Sin[2*ArcSin[c*x]] - Sin[4*ArcSin[c*x]] + 8*
ArcSin[c*x]^2*(-8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])) - 4*a*b*Sqrt[d]
```

```
*Sqrt[1 - c^2*x^2]*(16*Cos[2*ArcSin[c*x]] - Cos[4*ArcSin[c*x]] - 4*ArcSin[c
*x]*(6*ArcSin[c*x] - 8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c^5*
Sqrt[d]*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.476, size = 871, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -1/4*a^2*x^3/c^2/d*(-c^2*d*x^2+d)^(1/2)-3/8*a^2/c^4*x/d*(-c^2*d*x^2+d)^(1/2
)+3/8*a^2/c^4/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/
8*b^2*(-d*(c^2*x^2-1))^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
*x^4-3/8*b^2*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)*x^2+15/64*b^2*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*
x)^2*x^5-1/8*b^2*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)^2*x^3
+3/8*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)^2*x-1/8*b^2*(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)^3+1/
32*b^2*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*x^5+13/64*b^2*(-d*(c^2*x^2-1))^
(1/2)/c^2/d/(c^2*x^2-1)*x^3-15/64*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2
-1)*x-3/8*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*a
rcsin(c*x)^2-1/2*a*b*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*x^5-1
/4*a*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)*x^3+3/4*a*b*(-d
*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*x+15/64*a*b*(-d*(c^2*x^2-
1))^(1/2)/c^5/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-1/8*a*b*(-d*(c^2*x^2-1))^(1/
2)/c/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-3/8*a*b*(-d*(c^2*x^2-1))^(1/2)/c^
3/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2x^4\arcsin\left(cx\right)^2+2\,abx^4\arcsin\left(cx\right)+a^2x^4\right)\sqrt{-c^2dx^2+d}}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c
^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4 (a + b \operatorname{asin}(cx))^2}{\sqrt{-d (cx - 1) (cx + 1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^4}{\sqrt{-c^2 d x^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/sqrt(-c^2*d*x^2 + d), x)
```

3.236 $\int \frac{x^3(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=277

$$\frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{2bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c\sqrt{d-c^2dx^2}}-\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d}-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d}-$$

```
[Out] (4*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (14*b^2*(1 - c^2*
x^2))/(9*c^4*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*x^2)^2)/(27*c^4*Sqrt[d
- c^2*d*x^2]) + (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^3*Sqrt[d - c^2
*d*x^2]) + (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c*Sqrt[d - c^
2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d) - (x^2*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```

Rubi [A] time = 0.329423, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4707, 4677, 4619, 261, 4627, 266, 43}

$$\frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{2bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c\sqrt{d-c^2dx^2}}-\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d}-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```


```
[Out] (4*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (14*b^2*(1 - c^2*
x^2))/(9*c^4*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*x^2)^2)/(27*c^4*Sqrt[d
- c^2*d*x^2]) + (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^3*Sqrt[d - c^2
*d*x^2]) + (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c*Sqrt[d - c^
2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d) - (x^2*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```


Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
```

```
c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d}+\frac{2\int\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{3c^2}+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int x^2\left(a+b\sin\right.}{3c\sqrt{d-c^2dx^2}}$$

$$=\frac{2bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d}-\frac{x^2\sqrt{d-c^2dx^2}\left(a+\right.}{3c^2d}$$

$$=\frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{2bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d}-$$

$$=\frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{4b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^3\sqrt{d-c^2dx^2}}+\frac{2bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-}}{}$$

$$=\frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{14b^2\left(1-c^2x^2\right)}{9c^4\sqrt{d-c^2dx^2}}-\frac{2b^2\left(1-c^2x^2\right)^2}{27c^4\sqrt{d-c^2dx^2}}+\frac{4b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^3\sqrt{d-c^2dx^2}}+\frac{2bx^3}{}$$

Mathematica [A] time = 0.123847, size = 176, normalized size = 0.64

$$\frac{9a^2\left(c^4x^4+c^2x^2-2\right)+6abcx\sqrt{1-c^2x^2}\left(c^2x^2+6\right)+6b\sin^{-1}(cx)\left(3a\left(c^4x^4+c^2x^2-2\right)+bcx\sqrt{1-c^2x^2}\left(c^2x^2+6\right)\right)-}{27c^4\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (6*a*b*c*x*Sqrt[1 - c^2*x^2]*(6 + c^2*x^2) + 9*a^2*(-2 + c^2*x^2 + c^4*x^4)
 - 2*b^2*(-20 + 19*c^2*x^2 + c^4*x^4) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(6 + c
^2*x^2) + 3*a*(-2 + c^2*x^2 + c^4*x^4))*ArcSin[c*x] + 9*b^2*(-2 + c^2*x^2 +
 c^4*x^4)*ArcSin[c*x]^2)/(27*c^4*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.394, size = 750, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] a^2*(-1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+b^
2*(-1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2
)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)
/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)
*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^
2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsi
n(c*x))/c^4/d/(c^2*x^2-1)-1/216*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1
/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(
c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1))+2*a*b*(-1/72*(-d*(c^2*x^2-1))^(1
/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1
/2)*x*c+1)*(I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(
c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/d/(c^2*x^2-1)-3/8*(
-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/
c^4/d/(c^2*x^2-1)-1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c
^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^4
/d/(c^2*x^2-1))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.01907, size = 456, normalized size = 1.65

$$-\frac{6\left(abc^3x^3+6\,abcx+\left(b^2c^3x^3+6\,b^2cx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+\left(\left(9\,a^2-2\,b^2\right)c^4x^4+\left(9\,a^2-38\,b^2\right)c^2x^2+\right.}{27\left(c^6dx^2-c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] -1/27*(6*(a*b*c^3*x^3 + 6*a*b*c*x + (b^2*c^3*x^3 + 6*b^2*c*x)*arcsin(c*x))*
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + ((9*a^2 - 2*b^2)*c^4*x^4 + (9*a^2
 - 38*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 + b^2*c^2*x^2 - 2*b^2)*arcsin(c*x)^2 -
18*a^2 + 40*b^2 + 18*(a*b*c^4*x^4 + a*b*c^2*x^2 - 2*a*b)*arcsin(c*x))*sqrt(
-c^2*d*x^2 + d))/(c^6*d*x^2 - c^4*d)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \operatorname{asin}(cx))^2}{\sqrt{-d(cx-1)(cx+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^3}{\sqrt{-c^2 d x^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^3/sqrt(-c^2*d*x^2 + d), x)
```

3.237 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=206

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc^3\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d-c^2dx^2}}+\frac{b^2x\sqrt{d-c^2dx^2}}{4c^2d}-b^2\sqrt{}$$

```
[Out] (b^2*x*Sqrt[d - c^2*d*x^2])/(4*c^2*d) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])
/(4*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(2*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)
/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3*Sqrt[d - c^
2*d*x^2])
```

Rubi [A] time = 0.268924, antiderivative size = 213, normalized size of antiderivative = 1.03, number of steps used = 6, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {4707, 4643, 4641, 4627, 321, 216}

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc^3\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d-c^2dx^2}}+\frac{b^2x\left(1-c^2x^2\right)}{4c^2\sqrt{d-c^2dx^2}}-b^2\sqrt{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b^2*x*(1 - c^2*x^2))/(4*c^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*
ArcSin[c*x])/(4*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(2*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*Arc
Sin[c*x])^2)/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3
*Sqrt[d - c^2*d*x^2])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx=-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{2c^2}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int x\left(a+b\sin^{-1}(c\right.}{c\sqrt{d-c^2dx^2}}$$

$$=\frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-}}}{2\sqrt{d-c^2dx^2}}$$

$$=\frac{b^2x\left(1-c^2x^2\right)}{4c^2\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2c^2d}+\frac{\sqrt{}}{}$$

$$=\frac{b^2x\left(1-c^2x^2\right)}{4c^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{4c^3\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx}}{}$$

Mathematica [A] time = 1.18478, size = 210, normalized size = 1.02

$$\frac{12a^2cdx\left(c^2x^2-1\right)-12a^2\sqrt{d}\sqrt{d-c^2dx^2}\tan^{-1}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(c^2x^2-1\right)}\right)-6abd\sqrt{1-c^2x^2}\left(-2\sin^{-1}(cx)^2+2\sin\left(2\sin^{-1}(cx)\right)\sin^{-1}\right.}{24c^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (12*a^2*c*d*x*(-1 + c^2*x^2) - 12*a^2*Sqrt[d]*Sqrt[d - c^2*d*x^2]*ArcTan[(c
*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - 6*a*b*d*Sqrt[1 - c^2*x^
2]*(-2*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]
]) + b^2*d*Sqrt[1 - c^2*x^2]*(4*ArcSin[c*x]^3 - 6*ArcSin[c*x]*Cos[2*ArcSin[
c*x]] + (3 - 6*ArcSin[c*x]^2)*Sin[2*ArcSin[c*x]]))/(24*c^3*d*Sqrt[d - c^2*d
*x^2])
```

Maple [B] time = 0.271, size = 612, normalized size = 3.

$$-\frac{a^2x}{2c^2d}\sqrt{-c^2dx^2+d}+\frac{a^2}{2c^2}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{b^2\left(\arcsin(cx)\right)^2x^3}{2d\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}+\frac{b^2\left(\arcsin(cx\right.}{2c^2d\left(c^2x^2-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -1/2*a^2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2*a^2/c^2/(c^2*d)^(1/2)*arctan((c^2
*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2
-1)*arcsin(c*x)^2*x^3+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*arcs
in(c*x)^2*x-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)*(-c^
2*x^2+1)^(1/2)*x^2+1/4*b^2*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*x^3-1/4*b^2
*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*x-1/6*b^2*(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^3+1/4*b^2*(-d*(c^2*x^2-1))
^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/2*a*b*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2-a*b*(-d*(c^2
*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*x^3-1/2*a*b*(-d*(c^2*x^2-1))^(1/2)
/c/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+a*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c
^2*x^2-1)*arcsin(c*x)*x+1/4*a*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2x^2 \arcsin(cx)^2 + 2\,abx^2 \arcsin(cx) + a^2x^2\right)\sqrt{-c^2dx^2 + d}}{c^2dx^2 - d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c
^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2\,(a + b\,\text{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^2}{\sqrt{-c^2 d x^2 + d}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/sqrt(-c^2*d*x^2 + d), x)
```

3.238 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=146

$$\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}+\frac{2b^2\left(1-c^2x^2\right)}{c^2\sqrt{d-c^2dx^2}}+\frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{d-c^2dx^2}}$$

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))
/(c^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*Sqr
t[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^2*d)
```

Rubi [A] time = 0.1215, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4677, 4619, 261}

$$\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^2d}+\frac{2b^2\left(1-c^2x^2\right)}{c^2\sqrt{d-c^2dx^2}}+\frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))
/(c^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*Sqr
t[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^2*d)
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^2d} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\int\left(a+b\sin^{-1}(cx)\right)dx}{c\sqrt{d-c^2dx^2}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^2d} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int\sin^{-1}(cx)\,dx}{c\sqrt{d-c^2dx^2}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^2d} - \frac{\left(2b^2\sqrt{1-c\right.}{\sqrt{}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{2b^2\left(1-c^2x^2\right)}{c^2\sqrt{d-c^2dx^2}} + \frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.}{c^2d}$$

Mathematica [A] time = 0.0856313, size = 86, normalized size = 0.59

$$\frac{\left(c^2x^2-1\right)\left(a+b\sin^{-1}(cx)\right)^2+2b\sqrt{1-c^2x^2}\left(acx+b\sqrt{1-c^2x^2}+bcx\sin^{-1}(cx)\right)}{c^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] ((-1 + c^2*x^2)*(a + b*ArcSin[c*x])^2 + 2*b*Sqrt[1 - c^2*x^2]*(a*c*x + b*Sq
rt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]))/(c^2*Sqrt[d - c^2*d*x^2])
```

Maple [C] time = 0.142, size = 316, normalized size = 2.2

$$-\frac{a^2}{c^2d}\sqrt{-c^2dx^2+d}+b^2\left(-\frac{(\arcsin(cx))^2-2+2i\arcsin(cx)}{2c^2d\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\left(c^2x^2-i\sqrt{-c^2x^2+1}xc-1\right)-\frac{(\arcsin(cx}{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -a^2/c^2/d*(-c^2*d*x^2+d)^(1/2)+b^2*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I
*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2
-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin
(c*x)^2-2-2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1
)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c
*x)-I)/c^2/d/(c^2*x^2-1))
```

Maxima [A] time = 1.5907, size = 176, normalized size = 1.21

$$2b^2\left(\frac{x\arcsin(cx)}{c\sqrt{d}}+\frac{\sqrt{-c^2x^2+1}}{c^2\sqrt{d}}\right)+\frac{2abx}{c\sqrt{d}}-\frac{\sqrt{-c^2dx^2+d}b^2\arcsin(cx)^2}{c^2d}-\frac{2\sqrt{-c^2dx^2+d}ab\arcsin(cx)}{c^2d}-\frac{\sqrt{-c^2dx^2}}{c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 2*b^2*(x*arcsin(c*x)/(c*sqrt(d)) + sqrt(-c^2*x^2 + 1)/(c^2*sqrt(d))) + 2*a*
b*x/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b^2*arcsin(c*x)^2/(c^2*d) - 2*sqrt(-
c^2*d*x^2 + d)*a*b*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*x^2 + d)*a^2/(c^2*d)
```

Fricas [A] time = 1.86209, size = 312, normalized size = 2.14

$$-\frac{2\sqrt{-c^2dx^2+d}\left(b^2cx\arcsin\left(cx\right)+abcx\right)\sqrt{-c^2x^2+1}+\left(\left(a^2-2\,b^2\right)c^2x^2+\left(b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\,b^2+2\left(abc^2\right.\right.}{c^4dx^2-c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -(2*sqrt(-c^2*d*x^2 + d)*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt(-c^2*x^2 + 1)
 + ((a^2 - 2*b^2)*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 + 2*b^2
 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^4*d*x^2 - c^
2*d)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2x}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/sqrt(-c^2*d*x^2 + d), x)
```

3.239 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=49

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d-c^2dx^2}}$$

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.0911194, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {4643, 4641}

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d - c^2*d*x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] time = 0.167558, size = 64, normalized size = 1.31

$$\frac{\sqrt{1-c^2x^2}\sin^{-1}(cx)\left(3a^2+3ab\sin^{-1}(cx)+b^2\sin^{-1}(cx)^2\right)}{3c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(3*a^2 + 3*a*b*ArcSin[c*x] + b^2*ArcSin[c*x]
^2))/(3*c*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.053, size = 143, normalized size = 2.9

$$a^2\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}-\frac{b^2(\arcsin(cx))^3}{3dc\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}-\frac{ab(\arcsin(cx))^2}{dc\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] a^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/3*b^2*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^3-a*b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^2 - d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\,\mathrm{asin}(cx))^2}{\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2}{\sqrt{-c^2dx^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

3.240 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=257

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{2b^2\sqrt{1}}{}$$

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2
, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (2*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (
2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rubi [A] time = 0.340697, antiderivative size = 257, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {4713, 4709, 4183, 2531, 2282, 6589}

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{2b^2\sqrt{1}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*Sqrt[d - c^2*d*x^2]),x]
```


```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2
, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (2*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (
2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```


Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
```

```
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx, x, \sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\log\right.}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-\right.}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-\right.}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-\right.}{\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] time = 0.613659, size = 301, normalized size = 1.17

$$\frac{2ab\sqrt{1-c^2x^2}\left(i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)\left(\log\left(1-e^{i\sin^{-1}(cx)}\right)-\log\left(1+e^{i\sin^{-1}(c\right.\right.\right.}{\sqrt{d-c^2dx^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (a^2*Log[c*x])/Sqrt[d] - (a^2*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/Sqrt[d]
 + (2*a*b*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[
```

```
1 + E^(I*ArcSin[c*x])]) + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E
^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2] + (b^2*Sqrt[1 - c^2*x^2]*(ArcSin[c*
x]^2*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])]
+ (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*Poly
Log[2, E^(I*ArcSin[c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[3,
 E^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2]
```

Maple [A] time = 0.152, size = 387, normalized size = 1.5

$$-a^2 \ln\left(\frac{1}{x}\left(2d + 2\sqrt{d}\sqrt{-c^2dx^2+d}\right)\right)\frac{1}{\sqrt{d}} + \frac{b^2}{d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}\sqrt{-d\left(c^2x^2-1\right)}\left((\arcsin(cx))^2 \ln\left(1 + icx + \sqrt{-c^2x^2+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -a^2/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-ar
csin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*
polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))
/d/(c^2*x^2-1)-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(I*arcsin(
c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(
1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/
2)))/d/(c^2*x^2-1)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2 + 2\,ab\arcsin(cx) + a^2\right)}{c^2dx^3 - dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^3 - d*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\,\mathrm{asin}\,(cx))^2}{x\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin{(cx)} + a)^2}{\sqrt{-c^2dx^2 + d}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*x), x)
```

3.241 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=183

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx}-\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}+\frac{2bc\sqrt{1-c^2x}}{}$$

```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(d*x) + (2*b*c*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (I*
b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x
^2]
```

Rubi [A] time = 0.220229, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {4681, 4625, 3717, 2190, 2279, 2391}

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx}-\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}+\frac{2bc\sqrt{1-c^2x}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d - c^2*d*x^2]),x]
```


```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(d*x) + (2*b*c*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (I*
b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x
^2]
```


Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\sin^{-1}(cx)}{x}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx} - \frac{\left(4ibc\sqrt{1-c^2x^2}\right)\text{Subst}}{\sqrt{d}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx} + \frac{2bc\sqrt{1-c^2x^2}\left(a+b\sin\right.}{\sqrt{d}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx} + \frac{2bc\sqrt{1-c^2x^2}\left(a+b\sin\right.}{\sqrt{d}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{dx} + \frac{2bc\sqrt{1-c^2x^2}\left(a+b\sin\right.}{\sqrt{d}}$$

Mathematica [A] time = 0.385098, size = 159, normalized size = 0.87

$$-\frac{\sqrt{1-c^2x^2}\left(ib^2cx\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+a\left(a\sqrt{1-c^2x^2}-2bcx\log(cx)\right)+2b\sin^{-1}(cx)\left(a\sqrt{1-c^2x^2}-bcx\log\left(1-\right.\right.\right.}{x\sqrt{d-c^2dx^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[1 - c^2*x^2]*(b^2*(I*c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*A
rcSin[c*x]*(a*Sqrt[1 - c^2*x^2] - b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])]) + a
*(a*Sqrt[1 - c^2*x^2] - 2*b*c*x*Log[c*x]) + I*b^2*c*x*PolyLog[2, E^((2*I)*A
rcSin[c*x])]))/(x*Sqrt[d - c^2*d*x^2]))
```

Maple [B] time = 0.209, size = 638, normalized size = 3.5

$$-\frac{a^2}{dx}\sqrt{-c^2dx^2+d}+\frac{ib^2\left(\arcsin\left(cx\right)\right)^2c}{d\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}-\frac{b^2\left(\arcsin\left(cx\right)\right)^2xc^2}{d\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}+\frac{b^2\left(\arcsin\left(cx\right.\right.}{xd\left(c^2x^2-1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -a^2/d/x*(-c^2*d*x^2+d)^(1/2)+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c
^2*x^2-1)/d*(-c^2*x^2+1)^(1/2)*c-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(
c^2*x^2-1)*x/d*c^2+b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/x/d
-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c*arcsin(c*x
)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/d/(c^2*x^2-1)*c*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c*polylog(2,-I*c*x-(-
c^2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*
x^2-1)*c*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d
*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c-2*a*b*(-d*(c^2*x^2-1))^(1/2
)*arcsin(c*x)/(c^2*x^2-1)*x/d*c^2+2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/
(c^2*x^2-1)/x/d-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-
1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^2dx^4-dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^4 - d*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}{x^2\sqrt{-d\left(cx-1\right)\left(cx+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{\sqrt{-c^2dx^2 + d}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*x^2), x)
```

3.242 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=402

$$\frac{ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{b^2c^2\cdots}{}$$

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[d - c^2*d*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (
b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[d - c^2*d*x^2] +
 (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[d - c^2*d*x^2] - (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (b^2*c^2*Sqrt[1 - c^2*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (b^2*c^2*Sqrt[1 -
 c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rubi [A] time = 0.518702, antiderivative size = 402, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4701, 4713, 4709, 4183, 2531, 2282, 6589, 4627, 266, 63, 208}

$$\frac{ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}-\frac{b^2c^2\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[d - c^2*d*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (
b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[d - c^2*d*x^2] +
 (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[d - c^2*d*x^2] - (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (b^2*c^2*Sqrt[1 - c^2*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (b^2*c^2*Sqrt[1 -
 c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
```

```
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\sqrt{d-c^2dx^2}}\,dx=-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2}+\frac{1}{2}c^2\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d-c^2dx^2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\sin^{-1}(cx)}{x^2}}{\sqrt{d-c^2dx^2}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2x^2}\right)\int\frac{\left(a+b\sin^{-1}(c\right.}{x\sqrt{1-c^2x^2}}}{2\sqrt{d-c^2dx^2}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a\right.}{2\sqrt{d}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{\sqrt{d-c^2}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{\sqrt{d-c^2}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{\sqrt{d-c^2}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{\sqrt{d-c^2}}$$

Mathematica [A] time = 5.418, size = 487, normalized size = 1.21

$$\frac{2abc^2d^2\left(1-c^2x^2\right)^{3/2}\left(4i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-4i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+4\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx)}\right)-4\sin^{-1}(cx)\log\left(1+e^{i\sin^{-1}(cx)}\right)-2\tan\left(\frac{1}{2}\sin^{-1}(cx)\right)-2\right.}{\left(d-c^2dx^2\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-4*a^2*Sqrt[d - c^2*d*x^2])/x^2 + 4*a^2*c^2*Sqrt[d]*Log[x] - 4*a^2*c^2*Sq
rt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*c^2*d^2*(1 - c^2*x^2)^(
3/2)*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c
*x]*Log[1 - E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] +
 (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[c*x])]
 + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2
)^(3/2) + (b^2*c^2*d^2*(1 - c^2*x^2)^(3/2)*(-4*ArcSin[c*x]*Cot[ArcSin[c*x]/
2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]^2*Log[1 - E^(I*ArcS
in[c*x])] - 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[ArcSin[c
*x]/2]] + (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (8*I)*ArcSin[c
*x]*PolyLog[2, E^(I*ArcSin[c*x])] - 8*PolyLog[3, -E^(I*ArcSin[c*x])] + 8*Po
lyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*ArcSin
[c*x]*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2)^(3/2))/(8*d)
```

Maple [B] time = 0.322, size = 1107, normalized size = 2.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -1/2*a^2/d/x^2*(-c^2*d*x^2+d)^(1/2)-1/2*a^2*c^2/d^(1/2)*ln((2*d+2*d^(1/2)*(
-c^2*d*x^2+d)^(1/2))/x)-1/2*b^2*arcsin(c*x)^2*(-d*(c^2*x^2-1))^(1/2)/d/(c^2
*x^2-1)*c^2+b^2*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x/d/(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)*c+1/2*b^2*arcsin(c*x)^2*(-d*(c^2*x^2-1))^(1/2)/x^2/d/(c^2*x^2-1)
+1/2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin
(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2)
)+I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(
c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+b^2*(-c
^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polylog(3,-I*c*x-(
-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2
-1)*c^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c
^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))-a*b*(-
d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c^2+a*b*(-d*(c^2*x^2-1))^(1/
2)/x/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+a*b*arcsin(c*x)*(-d*(c^2*x^2-1))^(1
/2)/x^2/d/(c^2*x^2-1)+a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*
x^2-1)*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-a*b*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2
+1)^(1/2))-I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^
2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/
2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)}{c^2dx^5-dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{x^3\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2}{\sqrt{-c^2dx^2 + dx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*x^3), x)
```

3.243 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=319

$$-\frac{2ib^2c^3\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{d-c^2dx^2}}-\frac{2ic^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{d-c^2dx^2}}-\frac{2c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3dx}-bc$$

```
[Out] -(b^2*c^2*(1 - c^2*x^2))/(3*x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/(3*x^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*c^3*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x])^2)/(3*d*x) + (4*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 -
 E^((2*I)*ArcSin[c*x])])/(3*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*c^3*Sqrt[
1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rubi [A] time = 0.390316, antiderivative size = 319, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {4701, 4681, 4625, 3717, 2190, 2279, 2391, 4627, 264}

$$-\frac{2ib^2c^3\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3\sqrt{d-c^2dx^2}}-\frac{2ic^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{d-c^2dx^2}}-\frac{2c^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3dx}-bc$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -(b^2*c^2*(1 - c^2*x^2))/(3*x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/(3*x^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*c^3*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x])^2)/(3*d*x) + (4*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 -
 E^((2*I)*ArcSin[c*x])])/(3*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*c^3*Sqrt[
1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
```

```
& NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3}+\frac{1}{3}\left(2c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{d-c^2dx^2}}\,dx+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b}{}}{3\sqrt{d-c^2dx}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3}-\frac{2c^2\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{3dx}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3x\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3}-\frac{2c^2\sqrt{c}}{}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3x\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2\sqrt{d-c^2dx^2}}-\frac{2ic^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{d-c^2dx^2}}-\frac{\sqrt{d}}{}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3x\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2\sqrt{d-c^2dx^2}}-\frac{2ic^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{d-c^2dx^2}}-\frac{\sqrt{d}}{}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3x\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2\sqrt{d-c^2dx^2}}-\frac{2ic^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{d-c^2dx^2}}-\frac{\sqrt{d}}{}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3x\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2\sqrt{d-c^2dx^2}}-\frac{2ic^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{d-c^2dx^2}}-\frac{\sqrt{d}}{}$$

Mathematica [A] time = 0.671191, size = 269, normalized size = 0.84

$$-\frac{\sqrt{1-c^2x^2}\left(2ib^2c^3x^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+2a^2c^2x^2\sqrt{1-c^2x^2}+a^2\sqrt{1-c^2x^2}-4abc^3x^3\log(cx)-b\sin^{-1}(cx)\left(-2a\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -(Sqrt[1 - c^2*x^2]*(a*b*c*x + a^2*Sqrt[1 - c^2*x^2] + 2*a^2*c^2*x^2*Sqrt[1
 - c^2*x^2] + b^2*c^2*x^2*Sqrt[1 - c^2*x^2] + b^2*((2*I)*c^3*x^3 + Sqrt[1 -
 c^2*x^2] + 2*c^2*x^2*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - b*ArcSin[c*x]*(-(b
*c*x) - 2*a*Sqrt[1 - c^2*x^2]*(1 + 2*c^2*x^2) + 4*b*c^3*x^3*Log[1 - E^((2*I
)*ArcSin[c*x])]) - 4*a*b*c^3*x^3*Log[c*x] + (2*I)*b^2*c^3*x^3*PolyLog[2, E^
((2*I)*ArcSin[c*x])]))/(3*x^3*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.336, size = 2320, normalized size = 7.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] -4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)
*(-c^2*x^2+1)*c^6-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*
x^2*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5+a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*
x^4-2*c^2*x^2-1)/d*c^3*(-c^2*x^2+1)^(1/2)+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3
*c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(c*x)-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c
^4*x^4-2*c^2*x^2-1)/d*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+2/3*a*b*(-d*(c
^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^4+8/3*a*b*(-d*(c
```

```
^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)*c^2-4/3*a*b*(-c^2*
x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1
/2))^2-1)*c^3-4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^
5*c^8+2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6-4*
a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)*c^6-2/
3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*arcsin(c*x)^2*(-c^
2*x^2+1)^(1/2)*c^3-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)
/d*x^5*arcsin(c*x)*c^8+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^
2-1)/d*x^3*arcsin(c*x)*c^6-I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^
2-1)/d*x^2*(-c^2*x^2+1)^(1/2)*c^5+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x
^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^4+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x
^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*arcsin(c*x)^2+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-4/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)/d/(c^2*x^2-1)*c^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-4/3*b^
2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*arcsin(c*x)*l
n(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c
^2*x^2-1)/d/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+2/3*I*a*b*(-d*(c^2*x^2-1))
^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^4+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^
4*x^4-2*c^2*x^2-1)/d/x^2*(-c^2*x^2+1)^(1/2)*c-2/3*b^2*(-d*(c^2*x^2-1))^(1/2
)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6-2*b^2*(-d*(c^2*x^2-1))^(1/
2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)^2*c^6+1/3*b^2*(-d*(c^2*x^2-1))
^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)^2*c^4+4/3*b^2*(-d*(c^2*x^2-1
))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)^2*c^2+b^2*(-d*(c^2*x^2-1))
^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3-1/3*I*b
^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*x^2+1)^(1/2)*c^3-
1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6+2/3*b^2*(-
d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^4+1/3*b^2*(-d*(c^2*x^2-1
))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*
c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(c*x)^2-2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(
3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*(-c^2*x^2+1)*c^4+8/3*I*a*b*(-c^2*x^2
+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c^3-4/3*I*a*b*(-
d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6-2/3*I*a
*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*(-c^2*x^2+1)*c^4-4/3*
I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*c^3-2/3*a^2*c^2/d/x*(-c^2*d*x^2+d)^(1/2)-2/3*b^2*(-d*(c^2*x^2-1)
)^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^5*c^8-1/3*a^2/d/x^3*(-c^2*d*x^2+d)^(1/2
)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")

[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^2dx^6-dx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^6 - d*x^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{x^4 \sqrt{-d (cx - 1) (cx + 1)}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{\sqrt{-c^2 dx^2 + d} x^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*x^4), x)
```

3.244 $\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=549

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}+\frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d^2}+$$

```
[Out] (-16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d*Sqrt[d - c^2*d*x^2]) - (32*b^2*(1 -
c^2*x^2))/(9*c^6*d*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^2)/(27*c^6*d
*Sqrt[d - c^2*d*x^2]) - (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d*S
qrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d*
Sqrt[d - c^2*d*x^2]) - (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c
^3*d*Sqrt[d - c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2
*d*x^2]) + (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^2) + (4*x
^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2) + ((4*I)*b*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d -
c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c^6*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I
*E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.7414, antiderivative size = 549, normalized size of antiderivative = 1., number of steps used = 22, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {4703, 4707, 4677, 4619, 261, 4627, 266, 43, 4715, 4657, 4181, 2279, 2391}

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}+\frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```


```
[Out] (-16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d*Sqrt[d - c^2*d*x^2]) - (32*b^2*(1 -
c^2*x^2))/(9*c^6*d*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^2)/(27*c^6*d
*Sqrt[d - c^2*d*x^2]) - (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d*S
qrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d*
Sqrt[d - c^2*d*x^2]) - (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c
^3*d*Sqrt[d - c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2
*d*x^2]) + (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^2) + (4*x
^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2) + ((4*I)*b*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d -
c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c^6*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I
*E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d - c^2*d*x^2])
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
```

```
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
```

```
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx=\frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{4\int\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$=\frac{2bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c^3d\sqrt{d-c^2dx^2}}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{4x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c^4d^2}$$

$$=\frac{2bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d\sqrt{d-c^2dx^2}}-\frac{2bx^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3d\sqrt{d-c^2dx^2}}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}$$

$$=-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2b^2\left(1-c^2x^2\right)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^5d\sqrt{d-c^2dx^2}}-\frac{2bx^3\sqrt{1-c^2x^2}\left(a\right.}{9c^3d\sqrt{d-}}$$

$$=-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}+\frac{8b^2\left(1-c^2x^2\right)}{3c^6d\sqrt{d-c^2dx^2}}-\frac{2b^2\left(1-c^2x^2\right)^2}{9c^6d\sqrt{d-c^2dx^2}}-\frac{16b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2bx}{}$$

$$=-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}-\frac{32b^2\left(1-c^2x^2\right)}{9c^6d\sqrt{d-c^2dx^2}}+\frac{2b^2\left(1-c^2x^2\right)^2}{27c^6d\sqrt{d-c^2dx^2}}-\frac{16b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2b}{}$$

$$=-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}-\frac{32b^2\left(1-c^2x^2\right)}{9c^6d\sqrt{d-c^2dx^2}}+\frac{2b^2\left(1-c^2x^2\right)^2}{27c^6d\sqrt{d-c^2dx^2}}-\frac{16b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2b}{}$$

Mathematica [A] time = 0.681572, size = 453, normalized size = 0.83

$$\frac{-432ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+432ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)-72a^2c^4x^4-288a^2c^2x^2+576}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (576*a^2 - 378*b^2 - 288*a^2*c^2*x^2 - 72*a^2*c^4*x^4 + 810*a*b*ArcSin[c*x]
 + 405*b^2*ArcSin[c*x]^2 - 376*b^2*Cos[2*ArcSin[c*x]] + 360*a*b*ArcSin[c*x]
*Cos[2*ArcSin[c*x]] + 180*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + 2*b^2*Cos[
4*ArcSin[c*x]] - 18*a*b*ArcSin[c*x]*Cos[4*ArcSin[c*x]] - 9*b^2*ArcSin[c*x]^
2*Cos[4*ArcSin[c*x]] - 432*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I
*ArcSin[c*x])] + 432*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSi
n[c*x])] + 432*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] - 432*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2]] - (432*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (
432*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 372*a*b*Sin[
2*ArcSin[c*x]] - 372*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 6*a*b*Sin[4*ArcSi
n[c*x]] + 6*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]])/(216*c^6*d*Sqrt[d - c^2*d*x
^2])
```

Maple [B] time = 0.546, size = 1089, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -1/3*a^2*x^4/c^2/d/(-c^2*d*x^2+d)^(1/2)-4/3*a^2/c^4*x^2/d/(-c^2*d*x^2+d)^(1
/2)+8/3*a^2/c^6/d/(-c^2*d*x^2+d)^(1/2)+2/9*b^2*(-d*(c^2*x^2-1))^(1/2)/c^3/d
^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^3+10/3*b^2*(-d*(c^2*x^2-1))
^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-8/3*b^2*(-d*(c^
2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)^2-2/27*b^2*(-d*(c^2*x^2-1))
^(1/2)/c^2/d^2/(c^2*x^2-1)*x^4-92/27*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^
2*x^2-1)*x^2+94/27*b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)+1/3*b^2*(
-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^4+4/3*b^2*(-d*(c^
2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^2-2*I*b^2*(-c^2*x^2+1)^
(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*
x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(
c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1
)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-
1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2/3*a*b*(-d*(c^2*x^2-1))^
(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^4+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/c^
4/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2+2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))
^(1/2)/c^6/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-16/3*a*b*(-d*(c^2
*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)-2*a*b*(-c^2*x^2+1)^(1/2)*(-d
*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+2/9*
a*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3+10/3*
a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2x^5\arcsin\left(cx\right)^2+2\,abx^5\arcsin\left(cx\right)+a^2x^5\right)\sqrt{-c^2dx^2+d}}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^5*arcsin(c*x)^2 + 2*a*b*x^5*arcsin(c*x) + a^2*x^5)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)^2x^5}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^5/(-c^2*d*x^2 + d)^(3/2), x)
```

3.245 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=424

$$-\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}}+\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{bx^2\sqrt{1-c^2x^2}\,(\ldots}{2c^3d\sqrt{d\ldots}}$$

```
[Out] -(b^2*x*(1 - c^2*x^2))/(4*c^4*d*Sqrt[d - c^2*d*x^2]) + (b^2*Sqrt[1 - c^2*x^
2]*ArcSin[c*x])/(4*c^5*d*Sqrt[d - c^2*d*x^2]) - (b*x^2*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(2*c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])
^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^
2)/(c^5*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/(2*c^4*d^2) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c^5*d*Sq
rt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^(
(2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^2]
*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.642708, antiderivative size = 424, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {4703, 4707, 4643, 4641, 4627, 321, 216, 4715, 4675, 3719, 2190, 2279, 2391}

$$-\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}}+\frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2c^4d^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{bx^2\sqrt{1-c^2x^2}\,(\ldots}{2c^3d\sqrt{d\ldots}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```


```
[Out] -(b^2*x*(1 - c^2*x^2))/(4*c^4*d*Sqrt[d - c^2*d*x^2]) + (b^2*Sqrt[1 - c^2*x^
2]*ArcSin[c*x])/(4*c^5*d*Sqrt[d - c^2*d*x^2]) - (b*x^2*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(2*c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])
^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^
2)/(c^5*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/(2*c^4*d^2) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c^5*d*Sq
rt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^(
(2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^2]
*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2])
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
```

```
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
```

```
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{3\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right.}{2c^4d^2}$$

$$= \frac{b^2x\left(1-c^2x^2\right)}{2c^4d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2}}{}$$

$$= -\frac{b^2x\left(1-c^2x^2\right)}{4c^4d\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{2c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\right.}{c^2d\sqrt{}}$$

$$= -\frac{b^2x\left(1-c^2x^2\right)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\right.}{c^2d\sqrt{}}$$

$$= -\frac{b^2x\left(1-c^2x^2\right)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\right.}{c^2d\sqrt{}}$$

$$= -\frac{b^2x\left(1-c^2x^2\right)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\right.}{c^2d\sqrt{}}$$

Mathematica [A] time = 2.18484, size = 312, normalized size = 0.74

$$\frac{b^2\sqrt{d}\left(-8i\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\left(-4\sin^{-1}(cx)^3+2\left(\sin\left(2\sin^{-1}(cx)\right)-4i\right)\sin^{-1}(cx)^2-\sin\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a^2*c*Sqrt[d]*x*(-3 + c^2*x^2) + 12*a^2*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x
*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 2*a*b*Sqrt[d]*(8*c*x*ArcS
in[c*x] + Sqrt[1 - c^2*x^2]*(-6*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 4*Log[
1 - c^2*x^2] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])) + b^2*Sqrt[d]*(8*c*x*ArcS
in[c*x]^2 - (8*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + Sq
rt[1 - c^2*x^2]*(-4*ArcSin[c*x]^3 + 2*ArcSin[c*x]*(Cos[2*ArcSin[c*x]] + 8*L
og[1 + E^((2*I)*ArcSin[c*x])]) - Sin[2*ArcSin[c*x]] + 2*ArcSin[c*x]^2*(-4*I
 + Sin[2*ArcSin[c*x]]))))/(8*c^5*d^(3/2)*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.546, size = 976, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -1/2*a^2*x^3/c^2/d/(-c^2*d*x^2+d)^(1/2)+3/2*a^2/c^4*x/d/(-c^2*d*x^2+d)^(1/2
)-3/2*a^2/c^4/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-
2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(
c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^3/
d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2-1/4*b^2*(-d*(c^2*x^2-1))
^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2*I*a*b*(-c^2*x^2
+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)+I*b^2*(-d*
(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*polylog(2,-(I*c*x
+(-c^2*x^2+1)^(1/2))^2)+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c
^5/d^2/(c^2*x^2-1)*arcsin(c*x)^3-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^
2*x^2-1)*x^3+1/4*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*x+1/2*b^2*(
-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^3-3/2*b^2*(-d*(c^
2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x+3/2*a*b*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)^2+1/2*a*b*(-d*(c
^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+a*b*(-d*(c^2*x^
2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^3-1/4*a*b*(-d*(c^2*x^2-1))^(1
/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+I*b^2*(-d*(c^2*x^2-1))^(1/2)/c^5
/d^2/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)-3*a*b*(-d*(c^2*x^2-1))^(1
/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2x^4\arcsin\left(cx\right)^2+2\,abx^4\arcsin\left(cx\right)+a^2x^4\right)\sqrt{-c^2dx^2+d}}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^4\left(a+b\,\text{asin}\left(cx\right)\right)^2}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)^2x^4}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/(-c^2*d*x^2 + d)^(3/2), x)
```

3.246 $\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=412

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^4d^2}-\frac{4}{c^3}$$

```
[Out] (-4*a*b*x*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*
x^2))/(c^4*d*Sqrt[d - c^2*d*x^2]) - (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])
/(c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(c^3*d*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d -
 c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^4*d^2) + ((
4*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^
4*d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.454065, antiderivative size = 412, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {4703, 4677, 4619, 261, 4715, 4657, 4181, 2279, 2391}

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^4d^2}-\frac{4}{c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```


```
[Out] (-4*a*b*x*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*
x^2))/(c^4*d*Sqrt[d - c^2*d*x^2]) - (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])
/(c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(c^3*d*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d -
 c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^4*d^2) + ((
4*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^
4*d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2])
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
```

```
1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{2\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{2bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^4d^2} -$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b^2\left(1-c^2x^2\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b^2\left(1-c^2x^2\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\right.}{c^3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2\left(1-c^2x^2\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\right.}{c^3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2\left(1-c^2x^2\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\right.}{c^3d\sqrt{d-c^2dx^2}}$$

Mathematica [A] time = 0.534469, size = 369, normalized size = 0.9

$$\frac{-4ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) + 4ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) - 2a^2c^2x^2 + 4a^2 + 4ab\sqrt{1-c^2x^2}\log\left(c\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (4*a^2 - 2*b^2 - 2*a^2*c^2*x^2 + 6*a*b*ArcSin[c*x] + 3*b^2*ArcSin[c*x]^2 -
2*b^2*Cos[2*ArcSin[c*x]] + 2*a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + b^2*ArcSi
n[c*x]^2*Cos[2*ArcSin[c*x]] - 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I
*E^(I*ArcSin[c*x])] + 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*Ar
cSin[c*x])] + 4*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c
*x]/2]] - 4*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]] - (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I
)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*a*b*Sin[2*ArcSi
n[c*x]] - 2*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(2*c^4*d*Sqrt[d - c^2*d*x^2
])
```

Maple [B] time = 0.346, size = 830, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -a^2*x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2*a^2/d/c^4/(-c^2*d*x^2+d)^(1/2)+2*b^2*
(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x
+b^2*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^2-2*b^2*(-d
*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*x^2-2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^
4/d^2/(c^2*x^2-1)*arcsin(c*x)^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x
```

```
^2-1)-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)
*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*b
^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x
)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-
1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)+2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+2*a
*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2-4*a*b*(-d*(c^
2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)+2*a*b*(-c^2*x^2+1)^(1/2)*(-
d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-2*a
*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(
-c^2*x^2+1)^(1/2)-I)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(b^2x^3\arcsin\left(cx\right)^2+2\,abx^3\arcsin\left(cx\right)+a^2x^3\right)\sqrt{-c^2dx^2+d}}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^3}{(-c^2 d x^2 + d)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^3/(-c^2*d*x^2 + d)^(3/2), x)
```

3.247 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=250

$$-\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3d\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin\cdots\right.}{c^3d\sqrt{d-c^2dx\cdots}}$$

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2)/(c^3*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^3)/(3*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2
*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^
3*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.357123, antiderivative size = 250, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4703, 4643, 4641, 4675, 3719, 2190, 2279, 2391}

$$-\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3d\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin\cdots\right.}{c^3d\sqrt{d-c^2dx\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2)/(c^3*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^3)/(3*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2
*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^
3*d*Sqrt[d - c^2*d*x^2])
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
```

```
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(cx)\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x}\cdots}{c^2\cdots}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{\left(4ib\cdots\right.}{\cdots}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{\cdots}}{\cdots}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{\cdots}}{\cdots}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{\cdots}}{\cdots}$$

Mathematica [A] time = 0.567592, size = 295, normalized size = 1.18

$$\frac{b^2\left(\sin^{-1}(cx)\left(-\sqrt{1-c^2x^2}\left(\sin^{-1}(cx)+3i\right)\sin^{-1}(cx)+6\sqrt{1-c^2x^2}\log\left(1+e^{2i\sin^{-1}(cx)}\right)+3cx\sin^{-1}(cx)\right)-3i\sqrt{1-c^2x^2}\right.}{3c^3d\sqrt{d\left(1-c^2x^2\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((a^2*x*Sqrt[-(d*(-1 + c^2*x^2))])/(c^2*d^2*(-1 + c^2*x^2))) + (a^2*ArcTan
[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^3*d^(3/2)) +
 (a*b*(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2 - 2*Log[Sqrt[1
- c^2*x^2]])))/(c^3*d*Sqrt[d*(1 - c^2*x^2)]) + (b^2*(ArcSin[c*x]*(3*c*x*Arc
Sin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(3*I + ArcSin[c*x]) + 6*Sqrt[1 - c
^2*x^2]*Log[1 + E^((2*I)*ArcSin[c*x])]) - (3*I)*Sqrt[1 - c^2*x^2]*PolyLog[2
, -E^((2*I)*ArcSin[c*x])]))/(3*c^3*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] time = 0.237, size = 581, normalized size = 2.3

$$\frac{a^2x}{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}-\frac{a^2}{c^2d}\arctan\left(x\sqrt{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}}\right)\frac{1}{\sqrt{c^2d}}+\frac{b^2\left(\arcsin(cx)\right)^3}{3c^3d^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}+\frac{ib^2\left(\mathrm{arc}\right.}{c^3d^2\left(c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a^2*x/c^2/d/(-c^2*d*x^2+d)^(1/2)-a^2/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/
2)*x/(-c^2*d*x^2+d)^(1/2))+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)^3+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x
)^2/d^2/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsi
n(c*x)^2/d^2/c^2/(c^2*x^2-1)*x-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1
/2)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^
2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^3/(c^2*x^2-1)*polylog(2,-
(I*c*x+(-c^2*x^2+1)^(1/2))^2)+a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)^2+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-
1))^(1/2)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)-2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcs
in(c*x)/d^2/c^2/(c^2*x^2-1)*x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)/d^2/c^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2x^2\arcsin\left(cx\right)^2+2\,abx^2\arcsin\left(cx\right)+a^2x^2\right)\sqrt{-c^2dx^2+d}}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\,\text{asin}\left(cx\right)\right)^2}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)^2x^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(-c^2*d*x^2 + d)^(3/2), x)
```

3.248 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=208

$$-\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{4ib\sqrt{1-c^2\cdots}}{\cdots}$$

```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^
2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2
*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.185548, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4677, 4657, 4181, 2279, 2391}

$$-\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{4ib\sqrt{1-c^2\cdots}}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^
2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2
*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{a+b\sin^{-1}(cx)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\mathrm{Sub}}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\mathrm{Su}}{c^2}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\mathrm{Li}_2\left(-\right.}{c^2d\sqrt{d-c^2}}$$

Mathematica [A] time = 0.541635, size = 276, normalized size = 1.33

$$\frac{-2ib^2\sqrt{1-c^2x^2}\mathrm{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+2ib^2\sqrt{1-c^2x^2}\mathrm{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+a^2+2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\sin^{-1}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a^2 + 2*a*b*ArcSin[c*x] + b^2*ArcSin[c*x]^2 - 2*b^2*Sqrt[1 - c^2*x^2]*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*
Log[1 + I*E^(I*ArcSin[c*x])] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/
2] - Sin[ArcSin[c*x]/2]] - 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])] + (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(
c^2*d*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.133, size = 540, normalized size = 2.6

$$\frac{a^2}{c^2d}\frac{1}{\sqrt{-c^2dx^2+d}} - \frac{b^2\left(\arcsin(cx)\right)^2}{d^2c^2\left(c^2x^2-1\right)}\sqrt{-d\left(c^2x^2-1\right)} + \frac{2\,ib^2}{d^2c^2\left(c^2x^2-1\right)}\sqrt{-c^2x^2+1}\sqrt{-d\left(c^2x^2-1\right)}\mathrm{dilog}\left(1+i\left(icx+\sqrt{-c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a^2/c^2/d/(-c^2*d*x^2+d)^(1/2)-b^2*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-
1)*arcsin(c*x)^2+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/
(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*b^2*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2)))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)
*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)*(-
d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^
2+1)^(1/2)))-2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)+2
*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*ln(I*c*x
+(-c^2*x^2+1)^(1/2)+I)-2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/
d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\sqrt{d}\int \frac{\left(b^2 x \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)^2 + 2\,abx \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)\right)\sqrt{cx+1}\sqrt{-cx+1}}{c^4d^2x^4 - 2\,c^2d^2x^2 + d^2}\,dx + \frac{a^2}{\sqrt{-c^2dx^2 +}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] sqrt(d)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a
*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x) + a^2/(sqrt(-c^2*d*x^2 + d)*c^2*
d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2x\arcsin(cx)^2 + 2\,abx\arcsin(cx) + a^2x\right)}{c^4d^2x^4 - 2\,c^2d^2x^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
a^2*x)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a + b\operatorname{asin}(cx)\right)^2}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x}{(-c^2dx^2 + d)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/(-c^2*d*x^2 + d)^(3/2), x)
```

3.249 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=195

$$-\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{cd\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{cd\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\log\left(1\cdots\right.}{c\cdots}$$

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(c*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])
- (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d
- c^2*d*x^2])
```

Rubi [A] time = 0.161089, antiderivative size = 195, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {4653, 4675, 3719, 2190, 2279, 2391}

$$-\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{cd\sqrt{d-c^2dx^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{cd\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\log\left(1\cdots\right.}{c\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(c*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])
- (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d
- c^2*d*x^2])
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx &= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{x\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\sin^{-1}(cx)\right)}{cd\sqrt{d-c^2dx^2}}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{cd\sqrt{d-c^2dx^2}}+\frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x\right.}{cd\sqrt{d-c^2dx^2}}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{cd\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\log\left(1+\right.}{cd\sqrt{d-c^2dx^2}}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{cd\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\log\left(1+\right.}{cd\sqrt{d-c^2dx^2}}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{cd\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\log\left(1+\right.}{cd\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] time = 0.501894, size = 165, normalized size = 0.85

$$\frac{-ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+a\left(acx+b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)\right)+2b\sin^{-1}(cx)\left(acx+b\sqrt{1-c^2x^2}\log\left(1+\right.\right.}{cd\sqrt{d-c^2dx^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (b^2*(c*x - I*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*ArcSin[c*x]*(a*c*x + b
*Sqrt[1 - c^2*x^2]*Log[1 + E^((2*I)*ArcSin[c*x])]) + a*(a*c*x + b*Sqrt[1 -
c^2*x^2]*Log[1 - c^2*x^2]) - I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*A
rcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.119, size = 425, normalized size = 2.2

$$\frac{a^2x}{d}\frac{1}{\sqrt{-c^2dx^2+d}}+\frac{ib^2(\arcsin(cx))^2}{d^2c(c^2x^2-1)}\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}-\frac{b^2(\arcsin(cx))^2x}{d^2(c^2x^2-1)}\sqrt{-d(c^2x^2-1)}-2\frac{b^2\sqrt{-c^2x^2+}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a^2/d*x/(-c^2*d*x^2+d)^(1/2)+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/c/d
^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/
d^2/(c^2*x^2-1)*x-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^
2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^2*(-c^2*x^2+1)^
(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^2*x^2-1)*polylog(2,-(I*c*x+(-c^2*x^2+
1)^(1/2))^2)+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^2*x
^2-1)*arcsin(c*x)-2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/(c^2*x^2-1)*
x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^2/(c^2*x^2-1)*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\,\text{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(-c^2dx^2 + d)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(-c^2*d*x^2 + d)^(3/2), x)
```

3.250 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=467

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{2ib}{}$$

```
[Out] (a + b*ArcSin[c*x])^2/(d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqr
t[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[
2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x
^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]
) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c
*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*
ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3
, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.573021, antiderivative size = 467, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4705, 4713, 4709, 4183, 2531, 2282, 6589, 4657, 4181, 2279, 2391}

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{2ib}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(3/2)),x]
```



```
[Out] (a + b*ArcSin[c*x])^2/(d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqr
t[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[
2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x
^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]
) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c
*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*
ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3
, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```


Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] && !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d-c^2dx^2}}\,dx}{d} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}\,dx}{d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x\right.}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\,\text{Subst}\,(}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}\,(a+b}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}\,(a+b}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}\,(a+b}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}\,(a+b}{}$$

Mathematica [A] time = 1.94327, size = 667, normalized size = 1.43

$$\frac{2abd\left(i\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sqrt{1-c^2x^2}\sin^{-1}(cx)\log\left(1-e^{i\sin^{-1}(cx}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a^2*d + a^2*Sqrt[d]*Sqrt[d - c^2*d*x^2]*Log[c*x] - a^2*Sqrt[d]*Sqrt[d - c^
2*d*x^2]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + 2*a*b*d*(ArcSin[c*x] + Sqrt
[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*Ar
cSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2]] + I*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*S
qrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])]) + b^2*d*(ArcSin[c*x]^2 + Sq
rt[1 - c^2*x^2]*ArcSin[c*x]^2*Log[1 - E^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x
^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*ArcSin[c
*x]*Log[1 + I*E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*Log[1 +
E^(I*ArcSin[c*x])] + (2*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, -E^(I*A
```

```
rcSin[c*x])] - (2*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
 (2*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c
^2*x^2]*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x^2]*Pol
yLog[3, -E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*
x])]))/(d^2*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.244, size = 1096, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] a^2/d/(-c^2*d*x^2+d)^(1/2)-a^2/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/
2))/x)-b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)^2+b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x
+(-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2
*x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x
^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-
1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)*
(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))
-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*polylog(3,
I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)
/d^2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-
c^2*x^2+1)^(1/2)))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c
^2*x^2-1)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-4*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(
-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)-2*I*b^2*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsi
n(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+2*a*b*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*
c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^4d^2x^5-2\,c^2d^2x^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{x(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(-c^2dx^2 + d)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x), x)
```

3.251 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=333

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{2ic\sqrt{1-c\ldots}}{\ldots}$$

```
[Out] -((a + b*ArcSin[c*x])^2/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin
[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (4*b*c*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*Sqrt[
d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*
x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2
*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.437249, antiderivative size = 333, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {4701, 4653, 4675, 3719, 2190, 2279, 2391, 4679, 4419, 4183}

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}}-\frac{2ic\sqrt{1-c\ldots}}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```


```
[Out] -((a + b*ArcSin[c*x])^2/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin
[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (4*b*c*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*Sqrt[
d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*
x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2
*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
```

```
0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\sqrt{d-c^2dx^2}} + \left(2c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(1-c^2x^2\right)}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\sec(\right.}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} + \frac{\left(4bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(2x)\,dx,\right.}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{4bc\sqrt{1-c^2}}{}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{4bc\sqrt{1-c^2}}{}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{4bc\sqrt{1-c^2}}{}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{d\sqrt{d-c^2dx^2}} - \frac{4bc\sqrt{1-c^2}}{}$$

Mathematica [A] time = 0.703594, size = 322, normalized size = 0.97

$$\frac{-ib^2cx\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right) - ib^2cx\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) + 2a^2c^2x^2 - a^2 + 2abcx\sqrt{1-c^2x^2}\log}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-a^2 + 2*a^2*c^2*x^2 - 2*a*b*ArcSin[c*x] + 4*a*b*c^2*x^2*ArcSin[c*x] - b^2
*ArcSin[c*x]^2 + 2*b^2*c^2*x^2*ArcSin[c*x]^2 - (2*I)*b^2*c*x*Sqrt[1 - c^2*x
^2]*ArcSin[c*x]^2 + 2*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - E^((2*I
)*ArcSin[c*x])] + 2*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^((2*I)*
ArcSin[c*x])] + 2*a*b*c*x*Sqrt[1 - c^2*x^2]*Log[c*x] + a*b*c*x*Sqrt[1 - c^2
*x^2]*Log[1 - c^2*x^2] - I*b^2*c*x*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*A
rcSin[c*x])] - I*b^2*c*x*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])
])/(d*x*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.207, size = 807, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -a^2/d/x/(-c^2*d*x^2+d)^(1/2)+2*a^2*c^2/d*x/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*(-
d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*c-2*b
^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/d^2*x*c^2+b^2*(-d*(c^2*
x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/d^2/x-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*
```

```
(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*arcs
in(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2)
)+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*polyl
og(2,-I*c*x-(-c^2*x^2+1)^(1/2))+I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)/(c^2*x^2-1)/d^2*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*I*b^2*(-c
^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*polylog(2,I*c*x+(-
c^2*x^2+1)^(1/2))+4*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^
2-1)/d^2*arcsin(c*x)*c-4*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)
/d^2*x*c^2+2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)/d^2/x-2*a*b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)/d^2*ln((I*c*x+(-c^2*
x^2+1)^(1/2))^4-1)*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^4d^2x^6-2\,c^2d^2x^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}{x^2\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(-c^2dx^2 + d)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^2), x)
```

3.252 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=634

$$\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-$$

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x*Sqrt[d - c^2*d*x^2])) +
(3*c^2*(a + b*ArcSin[c*x])^2)/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x
])^2/(2*d*x^2*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*c^2*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d
 - c^2*d*x^2]) - (b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d*
Sqrt[d - c^2*d*x^2]) + ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*c^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
 + ((2*I)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt
[d - c^2*d*x^2]) - ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyL
og[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*b^2*c^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (3*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.927775, antiderivative size = 634, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.517, Rules used = {4701, 4705, 4713, 4709, 4183, 2531, 2282, 6589, 4657, 4181, 2279, 2391, 266, 63, 208}

$$\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-\frac{3ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d-c^2dx^2}}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x*Sqrt[d - c^2*d*x^2])) +
(3*c^2*(a + b*ArcSin[c*x])^2)/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x
])^2/(2*d*x^2*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*c^2*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d
 - c^2*d*x^2]) - (b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d*
Sqrt[d - c^2*d*x^2]) + ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*c^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
 + ((2*I)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt
[d - c^2*d*x^2]) - ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyL
og[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*b^2*c^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (3*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
```

```
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{1}{2}\left(3c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{3/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(1-c^2x^2\right)}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{\left(3c^2\right)\int \frac{\left(a+b\sin\right.}{x\sqrt{d}}}{2d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{\left(3c^2\sqrt{1-c^2x^2}\right.}{2d\sqrt{}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{4ibc^2\sqrt{1-c^2x}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{4ibc^2\sqrt{1-c^2x}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{4ibc^2\sqrt{1-c^2x}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{4ibc^2\sqrt{1-c^2x}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{4ibc^2\sqrt{1-c^2x}}{}$$

Mathematica [A] time = 8.16105, size = 844, normalized size = 1.33

$$\frac{3a^2\log(x)c^2}{2d^{3/2}} - \frac{3a^2\log\left(d+\sqrt{-d\left(c^2x^2-1\right)}\sqrt{d}\right)c^2}{2d^{3/2}} + \frac{b^2\sqrt{1-c^2x^2}\left(-\csc^2\left(\frac{1}{2}\sin^{-1}(cx)\right)\sin^{-1}(cx)^2 + \sec^2\left(\frac{1}{2}\sin^{-1}(cx)\right)\mathrm{si}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-a^2/(2*d^2*x^2) - (a^2*c^2)/(d^2*(-1 + c^2*x^2)
)) + (3*a^2*c^2*Log[x])/(2*d^(3/2)) - (3*a^2*c^2*Log[d + Sqrt[d]*Sqrt[-(d*(
-1 + c^2*x^2))]])/(2*d^(3/2)) + (a*b*c*((6*I)*PolyLog[2, -E^(I*ArcSin[c*x])
]*Sin[2*ArcSin[c*x]] - (6*I)*PolyLog[2, E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x
]] - (-2*ArcSin[c*x] + 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 3*ArcSin[c*x]*Cos
[3*ArcSin[c*x]]*Log[1 - E^(I*ArcSin[c*x])] - 3*ArcSin[c*x]*Cos[3*ArcSin[c*x
]]*Log[1 + E^(I*ArcSin[c*x])] + 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2]
 - Sin[ArcSin[c*x]/2]] - 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*(-3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x
])] + 3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2] -
 Sin[ArcSin[c*x]/2]] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*
Sin[2*ArcSin[c*x]])/(c*x)))/(4*d*x*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*Sqrt[1
 - c^2*x^2]*(8*ArcSin[c*x]^2 - 4*ArcSin[c*x]*Cot[ArcSin[c*x]/2] - ArcSin[c*
x]^2*Csc[ArcSin[c*x]/2]^2 + 8*Log[Tan[ArcSin[c*x]/2]] - 16*(ArcSin[c*x]*(Lo
g[1 - I*E^(I*ArcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2,
(-I)*E^(I*ArcSin[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])])) + 12*(ArcSin[c*
x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + (2*I)*ArcS
in[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) +
```

```
2*(-PolyLog[3, -E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])])) + ArcS
in[c*x]^2*Sec[ArcSin[c*x]/2]^2 + (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[
ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])
/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 4*ArcSin[c*x]*Tan[ArcSin[c*x]/
2]))/(8*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] time = 0.383, size = 1490, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -3/2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c^2+a*b*(-d*(
c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/x*(-c^2*x^2+1)^(1/2)*c-3/2*b^2*(-c^2*x^2+
1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)^2*ln(1-I*c*
x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*
x^2-1)/d^2*c^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)*ln(1-I*(
I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)/(c^2*x^2-1)/d^2*c^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b^2*(-d*(c^2*x^
2-1))^(1/2)/d^2/(c^2*x^2-1)/x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+3/2*b^2*(-c^
2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)^2*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/
2)/(c^2*x^2-1)/d^2*c^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*b^2*(-d*(c
^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/x^2*arcsin(c*x)^2-3*I*a*b*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*dilog(1+I*c*x+(-c^2*x^2+1)^(1
/2))-3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*
arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+3*I*b^2*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))+3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1
)/d^2*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-4*I*a*b*(-c^2*x^2+1)^(
1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arctan(I*c*x+(-c^2*x^2+1)^(
1/2))-3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2
*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-1/2*a^2/d/x^2/(-c^2*d*x^2+d)^(1/2)+3/2*a^2
*c^2/d/(-c^2*d*x^2+d)^(1/2)-3/2*a^2*c^2/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x
^2+d)^(1/2))/x)+b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d
^2*c^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2
-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-3*b^2*(
-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*polylog(3,I*c*
x+(-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^
2-1)/d^2*c^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^
2/(c^2*x^2-1)*arcsin(c*x)*c^2+a*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/x^
2*arcsin(c*x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)}{c^4d^2x^7-2\,c^2d^2x^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\,\text{asin}(cx))^2}{x^3(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(b\arcsin(cx)+a)^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^3), x)
```

3.253 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=483

$$-\frac{ib^2c^3\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{5ib^2c^3\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3d\sqrt{d-c^2dx^2}}+\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)^2}{3d\sqrt{d-c^2dx^2}}-\frac{8ic^{}}{}$$

```
[Out] -(b^2*c^2*(1 - c^2*x^2))/(3*d*x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(3*d*x^2*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])
^2/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x])^2)/(3*d*x*Sqr
t[d - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x])^2)/(3*d*Sqrt[d - c^2*d*x^2
]) - (((8*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d - c^
2*d*x^2]) - (20*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I
)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2]) + (16*b*c^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2])
 - (I*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d*Sqrt
[d - c^2*d*x^2]) - (((5*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)
*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.804111, antiderivative size = 483, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4701, 4653, 4675, 3719, 2190, 2279, 2391, 4679, 4419, 4183, 264}

$$-\frac{ib^2c^3\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{5ib^2c^3\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3d\sqrt{d-c^2dx^2}}+\frac{8c^4x\left(a+b\sin^{-1}(cx)\right)^2}{3d\sqrt{d-c^2dx^2}}-\frac{8ic^{}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```


```
[Out] -(b^2*c^2*(1 - c^2*x^2))/(3*d*x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(3*d*x^2*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])
^2/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x])^2)/(3*d*x*Sqr
t[d - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x])^2)/(3*d*Sqrt[d - c^2*d*x^2
]) - (((8*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d - c^
2*d*x^2]) - (20*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I
)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2]) + (16*b*c^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2])
 - (I*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d*Sqrt
[d - c^2*d*x^2]) - (((5*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)
*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} + \frac{1}{3}\left(4c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x^3\left(1-c^2x^2\right)}\,dx}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2\left(a+b\sin^{-1}(cx)\right)^2}{3dx\sqrt{d-c^2dx^2}} + \frac{1}{3}\left(8c^4\right)\int$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2\left(a+b\sin^{-1}(c\right.}{3dx\sqrt{d-c^2dx}}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2\left(a+b\sin^{-1}(c\right.}{3dx\sqrt{d-c^2dx}}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2\left(a+b\sin^{-1}(c\right.}{3dx\sqrt{d-c^2dx}}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2\left(a+b\sin^{-1}(c\right.}{3dx\sqrt{d-c^2dx}}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2\left(a+b\sin^{-1}(c\right.}{3dx\sqrt{d-c^2dx}}$$

$$= -\frac{b^2c^2\left(1-c^2x^2\right)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3dx^2\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2\left(a+b\sin^{-1}(c\right.}{3dx\sqrt{d-c^2dx}}$$

Mathematica [A] time = 0.852669, size = 462, normalized size = 0.96

$$\frac{-3ib^2c^3x^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right) - 5ib^2c^3x^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) + 8a^2c^4x^4 - 4a^2c^2x^2 - a^2 -}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-a^2 - 4*a^2*c^2*x^2 - b^2*c^2*x^2 + 8*a^2*c^4*x^4 + b^2*c^4*x^4 - a*b*c*x
*Sqrt[1 - c^2*x^2] - 2*a*b*ArcSin[c*x] - 8*a*b*c^2*x^2*ArcSin[c*x] + 16*a*b
*c^4*x^4*ArcSin[c*x] - b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - b^2*ArcSin[c
*x]^2 - 4*b^2*c^2*x^2*ArcSin[c*x]^2 + 8*b^2*c^4*x^4*ArcSin[c*x]^2 - (8*I)*b
^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 10*b^2*c^3*x^3*Sqrt[1 - c^2*x^
2]*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 6*b^2*c^3*x^3*Sqrt[1 - c^2*
x^2]*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] + 10*a*b*c^3*x^3*Sqrt[1 - c
^2*x^2]*Log[c*x] + 3*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - (3*I)
*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (5*I)*b
^2*c^3*x^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*d*x^3*Sq
rt[d - c^2*d*x^2])
```

Maple [B] time = 0.372, size = 2845, normalized size = 5.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] -32/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c
*x)*(-c^2*x^2+1)*c^6+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2
-1)/d^2*x^5*arcsin(c*x)*(-c^2*x^2+1)*c^8-64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/
(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5-8/3*I*
b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*(-c^2*
x^2+1)*c^4+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^
5*(-c^2*x^2+1)*c^8-32/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1
)/d^2*x^3*(-c^2*x^2+1)*c^6-8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^
2*x^2-1)/d^2*x*(-c^2*x^2+1)*c^4-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^
4-7*c^2*x^2-1)/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+32/3*I*a*b*(-c^2*x^2+
1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*c^3-1/3*a^2/d/x
^3/(-c^2*d*x^2+d)^(1/2)+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2
-1)/d^2*(-c^2*x^2+1)^(1/2)*c^3+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*
c^2*x^2-1)/d^2/x^3*arcsin(c*x)-8/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*
c^2*x^2-1)/d^2*x^3*(-c^2*x^2+1)*c^6+32/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*
x^4-7*c^2*x^2-1)/d^2*x^5*(-c^2*x^2+1)*c^8+8/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8
*c^4*x^4-7*c^2*x^2-1)/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+8*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)^2*c^4+4*b^2*(-d*(c
^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)^2*c^2-64/3*b^2*(
-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c*x)^2*c^6-1/3
*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2
)*c^3-128/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*ar
csin(c*x)*(-c^2*x^2+1)^(1/2)*c^5-4/3*a^2*c^2/d/x/(-c^2*d*x^2+d)^(1/2)+16*a*
b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*c^4+8*a*
b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)*c^2+1/3*
a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^2*(-c^2*x^2+1)^(1/
2)*c-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^3-10/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+
1)^(1/2)/d^2/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^3+64/3*I*a*b*
(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^7*c^10-32*I*a*b*(-d*(c
^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*c^8+8*I*b^2*(-d*(c^2*x^2-1
))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c*x)*c^6-8/3*I*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*(-c^2*x^2+1)^(1/2)*c^5+8/3*I
*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*c^4+1
6/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*arc
sin(c*x)^2+10/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^
2-1)*c^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+10/3*I*b^2*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2))-32*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*arcsin
(c*x)*c^8-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*arcs
in(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x
^4-7*c^2*x^2-1)/d^2*x^7*arcsin(c*x)*c^10+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*
c^4*x^4-7*c^2*x^2-1)/d^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+I*b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)+8*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)
/d^2*x^3*c^6+8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x
*c^4-128/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsi
n(c*x)*c^6-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*
c^3*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-10/3*b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*arcsin(c*x)*ln(1-I*c*x-(-c^2
```

```
*x^2+1)^(1/2))-10/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*
x^2-1)*c^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-40/3*b^2*(-d*(c^2*x^2
-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*c^8+7/3*b^2*(-d*(c^2*x^2-1))^(1/
2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*
x^4-7*c^2*x^2-1)/d^2/x*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*
x^2-1)/d^2/x^3*arcsin(c*x)^2+32/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c
^2*x^2-1)/d^2*x^7*c^10+8/3*a^2*c^4/d*x/(-c^2*d*x^2+d)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)}{c^4d^2x^8-2\,c^2d^2x^6+d^2x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(b\arcsin(cx)+a)^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^4), x)
```

3.254 $\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=546

$$\frac{11ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}-\frac{11ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}+\frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{bx^3\left(a+\right.}{3c^3d^2\sqrt{1-c}}$$

```
[Out] b^2/(3*c^6*d^2*Sqrt[d - c^2*d*x^2]) + (16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d
^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))/(c^6*d^2*Sqrt[d - c^2*d*x^2
]) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2
]) - (b*x^3*(a + b*ArcSin[c*x]))/(3*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]) - (11*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^5*d^2*Sqrt[d
- c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(3*c^2*d*(d - c^2*d*x^2)^(3/2))
 - (4*x^2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (8*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^3) - (((22*I)/3)*b*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c
^2*d*x^2]) + (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[
c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2]) - (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*P
olyLog[2, I*E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.864716, antiderivative size = 546, normalized size of antiderivative = 1., number of steps used = 26, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4703, 4677, 4619, 261, 4715, 4657, 4181, 2279, 2391, 266, 43}

$$\frac{11ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}-\frac{11ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}+\frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{bx^3\left(a+\right.}{3c^3d^2\sqrt{1-c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```


```
[Out] b^2/(3*c^6*d^2*Sqrt[d - c^2*d*x^2]) + (16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d
^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))/(c^6*d^2*Sqrt[d - c^2*d*x^2
]) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2
]) - (b*x^3*(a + b*ArcSin[c*x]))/(3*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]) - (11*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^5*d^2*Sqrt[d
- c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(3*c^2*d*(d - c^2*d*x^2)^(3/2))
 - (4*x^2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (8*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^3) - (((22*I)/3)*b*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c
^2*d*x^2]) + (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[
c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2]) - (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*P
olyLog[2, I*E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2])
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
```

```
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(e*(m + 2*p + 1)), x] + (Dist[(f^2*(m - 1))/(c^2*(m + 2*
p + 1)), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(c*(m + 2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c
*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0] && GtQ[m, 1] && NeQ[m + 2*p + 1, 0] && IntegerQ[m]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{4\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{4x^2\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{8\int \frac{x(a+}{}}{}$$

$$= -\frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{11b^2\left(1-c^2x^2\right)}{3c^6d^2\sqrt{d-c^2dx^2}} - \frac{bx^3\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}\,(a}{3c^5d^2\sqrt{d-}}$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{10b^2\left(1-c^2x^2\right)}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} -$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{2b^2\left(1-c^2x^2\right)}{c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} -$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{2b^2\left(1-c^2x^2\right)}{c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} -$$

Mathematica [A] time = 1.54207, size = 594, normalized size = 1.09

$$\frac{\sqrt{d-c^2dx^2}\left(88ib^2\left(1-c^2x^2\right)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) - 88ib^2\left(1-c^2x^2\right)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) - 24a^2c^4x^4 + 9\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(-64*a^2 + 22*b^2 + 96*a^2*c^2*x^2 - 24*a^2*c^4*x^4 -
50*a*b*ArcSin[c*x] - 25*b^2*ArcSin[c*x]^2 + 28*b^2*Cos[2*ArcSin[c*x]] - 72*
a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 36*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]
```

```
] + 6*b^2*Cos[4*ArcSin[c*x]] - 6*a*b*ArcSin[c*x]*Cos[4*ArcSin[c*x]] - 3*b^2
*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 66*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Lo
g[1 - I*E^(I*ArcSin[c*x])] + 22*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 -
I*E^(I*ArcSin[c*x])] - 66*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*
ArcSin[c*x])] - 22*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin
[c*x])] - 66*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]
/2]] - 22*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
]] + 66*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]
+ 22*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] +
(88*I)*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (88*I)*
b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 8*a*b*Sin[2*ArcSi
n[c*x]] + 8*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 6*a*b*Sin[4*ArcSin[c*x]] +
 6*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]]))/(24*c^6*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] time = 0.523, size = 1201, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -10/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^6*arcsin(c*x)-2*a*b*(-
d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-2*a*b*(-d*(c^
2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcsin(c*x)*x^2+4*a*b*(-d*(c^2*x^2-1))^
(1/2)/d^3/(c^2*x^2-1)^2/c^4*arcsin(c*x)*x^2-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(c^2*x^2-1)^2/c^5*(-c^2*x^2+1)^(1/2)*x-11/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+11/3*
a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+
(-c^2*x^2+1)^(1/2)-I)-2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)+11/3
*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c
*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-11/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2
*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))-11/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^
2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+11/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-
d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))-2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)*x-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^5*arcsin(c*x)
*(-c^2*x^2+1)^(1/2)*x+2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*x^2+
b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)^2-1/3*b^2*(-d*(c
^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^4*x^2-5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d
^3/(c^2*x^2-1)^2/c^6*arcsin(c*x)^2-8/3*a^2/c^6/d/(-c^2*d*x^2+d)^(3/2)+1/3*b
^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^6-a^2*x^4/c^2/d/(-c^2*d*x^2+d
)^(3/2)+4*a^2/c^4*x^2/d/(-c^2*d*x^2+d)^(3/2)+2*b^2*(-d*(c^2*x^2-1))^(1/2)/d
^3/(c^2*x^2-1)^2/c^4*arcsin(c*x)^2*x^2-b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(
c^2*x^2-1)*arcsin(c*x)^2*x^2+2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-
1)*arcsin(c*x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2x^5 \arcsin\left(cx\right)^2 + 2\,abx^5 \arcsin\left(cx\right) + a^2x^5\right)\sqrt{-c^2dx^2 + d}}{c^6d^3x^6 - 3\,c^4d^3x^4 + 3\,c^2d^3x^2 - d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^5*arcsin(c*x)^2 + 2*a*b*x^5*arcsin(c*x) + a^2*x^5)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b \arcsin\left(cx\right) + a\right)^2 x^5}{\left(-c^2dx^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^5/(-c^2*d*x^2 + d)^(5/2), x)
```

3.255 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=421

$$\frac{4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{3bc^5d^2\sqrt{d-c^2dx^2}}$$

```
[Out] (b^2*x)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c^3*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*c^
2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d^2*Sqrt[d - c^
2*d*x^2]) + (((4*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^5*d^2*Sq
rt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^5*d^2
*Sqrt[d - c^2*d*x^2]) - (8*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 +
E^((2*I)*ArcSin[c*x])])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (((4*I)/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d^2*Sqrt[d - c^2*d
*x^2])
```

Rubi [A] time = 0.725995, antiderivative size = 421, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {4703, 4643, 4641, 4675, 3719, 2190, 2279, 2391, 288, 216}

$$\frac{4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{3bc^5d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```


```
[Out] (b^2*x)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c^3*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*c^
2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d^2*Sqrt[d - c^
2*d*x^2]) + (((4*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^5*d^2*Sq
rt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^5*d^2
*Sqrt[d - c^2*d*x^2]) - (8*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 +
E^((2*I)*ArcSin[c*x])])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (((4*I)/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d^2*Sqrt[d - c^2*d
*x^2])
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^2}dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{\left(a+b\sin^{-1}(cx\right.}{\sqrt{d-c^2dx^2}}}{c^4d^2}$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x\left(a+b\sin^{-1}(cx\right.}{c^4d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(\right.}{3c^2d\left(d-c^2dx^2\right.}$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(\right.}{3c^2d\left(d-c^2dx^2\right.}$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(\right.}{3c^2d\left(d-c^2dx^2\right.}$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(\right.}{3c^2d\left(d-c^2dx^2\right.}$$

Mathematica [A] time = 1.48498, size = 374, normalized size = 0.89

$$\frac{b^2\sqrt{d}\left(4i\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)-c^3x^3+4c^3x^3\sin^{-1}(cx)^2+\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)^3+4i\left(1-c^2x^2\right)^{3/2}\sin\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (a^2*c*Sqrt[d]*x*(-3 + 4*c^2*x^2) + 3*a^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2
]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b^2*Sqrt[d]*
(c*x - c^3*x^3 - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 3*c*x*ArcSin[c*x]^2 + 4*c^
3*x^3*ArcSin[c*x]^2 + (4*I)*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 + (1 - c^2*x^
2)^(3/2)*ArcSin[c*x]^3 - 8*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*Log[1 + E^((2*I)
*ArcSin[c*x])] + (4*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x]
)]) - a*b*Sqrt[d]*(Sqrt[1 - c^2*x^2] + (1 - c^2*x^2)^(3/2)*(-3*ArcSin[c*x]^
2 + 4*Log[1 - c^2*x^2]) + 2*ArcSin[c*x]*Sin[3*ArcSin[c*x]]))/(3*c^5*d^(5/2)
*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.556, size = 3907, normalized size = 9.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -a^2/c^4/d^2*x/(-c^2*d*x^2+d)^(1/2)+1/3*a^2*x^3/c^2/d/(-c^2*d*x^2+d)^(3/2)+
17*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2
*x^2+16)*x^5+13*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c
^4*x^4-71*c^2*x^2+16)/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+64*I*a*b*(-d*(
c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*c*a
rcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^6-168*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*
c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*x^4-40/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^
4*x^4-71*c^2*x^2+16)/c^2*arcsin(c*x)*x^3-55/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/
d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^3*x^2*(-c^2*x^2+1)^
(1/2)-64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*
x^4-71*c^2*x^2+16)/c^5*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)-16/3*I*b^2*(-d*(c^2
*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*c^2*ar
csin(c*x)*x^7+8/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^
2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-8*b^2*(-d*(c^2*x^2-
1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*x^4+21*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-8
7*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c*(-c^2*x^2+1)^(1/2)*x^4+362/3*a*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c
^2*arcsin(c*x)*x^3+13*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6
+118*c^4*x^4-71*c^2*x^2+16)/c^3*x^2*(-c^2*x^2+1)^(1/2)-32*a*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^4*arcsin(
c*x)*x+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c^2*x^2-1
)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c*x)^2-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*c^2*x^7-40/3*I*a*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)
/c^2*x^3+4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*
x^4-71*c^2*x^2+16)/c^4*x-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-
87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*(-c^2*x^2+1)*x^5+64*a*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*c^2*arcsin(
c*x)*x^7-8*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^
4-71*c^2*x^2+16)/c*(-c^2*x^2+1)^(1/2)*x^4+4*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^
3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^4*arcsin(c*x)*x-8/3*I
*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c
*x)^2-4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-
1)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-16/3*I*b^2*(-d*(c^2*x^2-1))^(1/
2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*arcsin(c*x)*(-c^2*
x^2+1)*x^5-8*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^
4*x^4-71*c^2*x^2+16)*c*(-c^2*x^2+1)^(1/2)*x^6+220/3*I*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^3*arcsin(c*x)
^2*(-c^2*x^2+1)^(1/2)*x^2-4*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87
*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^4*arcsin(c*x)*(-c^2*x^2+1)*x+32*I*b^2
*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+1
6)*c*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^6+28/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^2*(-c^2*x^2+1)*x^3
-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c
^2*x^2+16)/c^4*(-c^2*x^2+1)*x-128/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^
8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^5*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)-16/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1
)*arcsin(c*x)-84*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+11
8*c^4*x^4-71*c^2*x^2+16)/c*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^4+28/3*I*b^2*
(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16
)/c^2*arcsin(c*x)*(-c^2*x^2+1)*x^3+440/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(
24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^3*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)*x^2+4*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^
4*x^4-71*c^2*x^2+16)/c^4*x+4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-8
7*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*(-c^2*x^2+1)*x^5-76*b^2*(-d*(c^2*x^2-1
))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*arcsin(c*x)^
```

```
2*x^5-20/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^
4-71*c^2*x^2+16)*c^2*x^7-43/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87
*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^2*x^3+a^2/c^4/d^2/(c^2*d)^(1/2)*arcta
n((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-8/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/
(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^2*(-c^2*x^2+1)*x^3+4/3*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^
2+16)/c^4*(-c^2*x^2+1)*x-16/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87
*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^5*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+32*b
^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2
+16)*c^2*arcsin(c*x)^2*x^7+181/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8
-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^2*arcsin(c*x)^2*x^3-16*b^2*(-d*(c^
2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^4*a
rcsin(c*x)^2*x-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c
^2*x^2-1)*arcsin(c*x)^3+16/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-8
7*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)/c^5*(-c^2*x^2+1)^(1/2)+44/3*I*b^2*(-d*
(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*ar
csin(c*x)*x^5-16/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+11
8*c^4*x^4-71*c^2*x^2+16)/c^5*(-c^2*x^2+1)^(1/2)-152*a*b*(-d*(c^2*x^2-1))^(1
/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*c^2*x^2+16)*arcsin(c*x)*x^5+4
4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(24*c^8*x^8-87*c^6*x^6+118*c^4*x^4-71*
c^2*x^2+16)*x^5
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2x^4\arcsin\left(cx\right)^2+2\,abx^4\arcsin\left(cx\right)+a^2x^4\right)\sqrt{-c^2dx^2+d}}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^4}{(-c^2 d x^2 + d)^{\frac{5}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/(-c^2*d*x^2 + d)^(5/2), x)
```

3.256 $\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=332

$$\frac{5ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{5ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2\left(a+b\right.}{3c^4d^2}$$

```
[Out] b^2/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c^3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(3*c^2
*d*(d - c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c
^2*d*x^2]) - (((10*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(
I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)/3)*b^2*Sqrt[1 - c^
2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) -
(((5*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d^2*
Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.489147, antiderivative size = 332, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4703, 4677, 4657, 4181, 2279, 2391, 261}

$$\frac{5ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{5ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2\left(a+b\right.}{3c^4d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```


```
[Out] b^2/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c^3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(3*c^2
*d*(d - c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c
^2*d*x^2]) - (((10*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(
I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)/3)*b^2*Sqrt[1 - c^
2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) -
(((5*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d^2*
Sqrt[d - c^2*d*x^2])
```


Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
```

```
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx=\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2\int\frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}dx}{3c^2d}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^2}dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$=-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2\left(a+b\sin^{-1}(cx)\right)^2}{3c^4d^2\sqrt{d-c^2dx^2}}+\frac{\left(b\sqrt{1-c^2x^2}\right.}{3c^3d^2\sqrt{}}$$

$$=\frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2\left(a+b\sin^{-1}(cx\right.}{3c^4d^2\sqrt{d-c^2dx}}$$

$$=\frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2\left(a+b\sin^{-1}(cx\right.}{3c^4d^2\sqrt{d-c^2dx}}$$

$$=\frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2\left(a+b\sin^{-1}(cx\right.}{3c^4d^2\sqrt{d-c^2dx}}$$

$$=\frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2\left(a+b\sin^{-1}(cx\right.}{3c^4d^2\sqrt{d-c^2dx}}$$

Mathematica [A] time = 0.833875, size = 511, normalized size = 1.54

$$\frac{-20ib^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+20ib^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)-12a^2c^2x^2+8a^2+15ab\sqrt{1-}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (8*a^2 - 2*b^2 - 12*a^2*c^2*x^2 + 4*a*b*ArcSin[c*x] + 2*b^2*ArcSin[c*x]^2 -
 2*b^2*Cos[2*ArcSin[c*x]] + 12*a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 6*b^2*A
rcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[
1 - I*E^(I*ArcSin[c*x])] - 5*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - I*E
^(I*ArcSin[c*x])] + 15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*Arc
Sin[c*x])] + 5*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x
])] + 15*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]
 + 5*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] -
15*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 5*a
*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - (20*I)
*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (20*I)*b^2*(1
 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 2*a*b*Sin[2*ArcSin[c*x]
] + 2*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(12*c^4*d^2*(-1 + c^2*x^2)*Sqrt[d
 - c^2*d*x^2])
```

Maple [B] time = 0.283, size = 829, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] a^2*x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/3*a^2/d/c^4/(-c^2*d*x^2+d)^(3/2)+b^2*(
-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^2*arcsin(c*x)^2*x^2-1/3*b^2*(-d*(
c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-1/
3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^2*x^2-2/3*b^2*(-d*(c^2*x^2
-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^4*arcsin(c*x)^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/
2)/d^3/(c^2*x^2-1)^2/c^4-5/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)/c^4/d^3/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/3*I*b^2*(-c^2
*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*dilog(1-I*(I*c*x+(
-c^2*x^2+1)^(1/2)))+5/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d
^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5/3*b^2*(-c^2
*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1-I
*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2
/c^2*arcsin(c*x)*x^2-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^3*(
-c^2*x^2+1)^(1/2)*x-4/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^4*ar
csin(c*x)-5/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^
2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+5/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2
-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2x^3\arcsin\left(cx\right)^2+2\,abx^3\arcsin\left(cx\right)+a^2x^3\right)\sqrt{-c^2dx^2+d}}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin (cx) + a)^2 x^3}{(-c^2 dx^2 + d)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^3/(-c^2*d*x^2 + d)^(5/2), x)
```

3.257 $\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=332

$$\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\text{lo}}{}$$

```
[Out] (b^2*x)/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c*d^2*S
qrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*d*(d
 - c^2*d*x^2)^(3/2)) + ((I/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3
*d^2*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) + ((I/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d^2*Sqrt[d - c^2*d
*x^2])
```

Rubi [A] time = 0.352305, antiderivative size = 332, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {4681, 4703, 4675, 3719, 2190, 2279, 2391, 288, 216}

$$\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\text{lo}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```


```
[Out] (b^2*x)/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c*d^2*S
qrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*d*(d
 - c^2*d*x^2)^(3/2)) + ((I/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3
*d^2*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) + ((I/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d^2*Sqrt[d - c^2*d
*x^2])
```


Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
```

```
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^2 \left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}} + \cdots$$

$$= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\cdots}{\cdots}$$

$$= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}\cdots\right.}{3d\left(d-c^2d\cdots\right.}$$

$$= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}\cdots\right.}{3d\left(d-c^2d\cdots\right.}$$

$$= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}\cdots\right.}{3d\left(d-c^2d\cdots\right.}$$

$$= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3\left(a+b\sin^{-1}\cdots\right.}{3d\left(d-c^2d\cdots\right.}$$

Mathematica [A] time = 0.802718, size = 303, normalized size = 0.91

$$\frac{-ib^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right) - a^2c^3x^3 + ab\sqrt{1-c^2x^2} - abc^2x^2\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right) + ab\sqrt{1-c^2x^2}\,\mathrm{lo}\cdots}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-(b^2*c*x) - a^2*c^3*x^3 + b^2*c^3*x^3 + a*b*Sqrt[1 - c^2*x^2] + I*b^2*(I*
c^3*x^3 - Sqrt[1 - c^2*x^2] + c^2*x^2*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + b*
ArcSin[c*x]*(-2*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*(1 - c^2*x^2)^(3/2)*L
og[1 + E^((2*I)*ArcSin[c*x])]) + a*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - a
*b*c^2*x^2*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - I*b^2*(1 - c^2*x^2)^(3/2)*P
olyLog[2, -E^((2*I)*ArcSin[c*x])])/(3*c^3*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d
*x^2])
```

Maple [B] time = 0.303, size = 3277, normalized size = 9.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -4/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^3/(c^2*x^2-1)*ar
csin(c*x)+I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-
```

```
5*c^2*x^2+1)*c^3*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^6-2*I*b^2*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*arcsin(c*x)^2*
(-c^2*x^2+1)^(1/2)*x^4+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^
6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^2-1/3*I*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
*c^2*arcsin(c*x)*(-c^2*x^2+1)*x^5-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c
^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*(-c^2*x^2+1)*x^5-1/3*b^2*(-d*(
c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3+1/3*
a^2/c^2/d*x/(-c^2*d*x^2+d)^(3/2)-1/3*a^2/c^2/d^2*x/(-c^2*d*x^2+d)^(1/2)+2*I
*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1
)*c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^6-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*x^4+8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^
4-5*c^2*x^2+1)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+1/3*I*a*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3
-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2
*x^2+1)*c^4*arcsin(c*x)*x^7-2/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)/c^3/d^3/(c^2*x^2-1)*arcsin(c*x)^2-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*arcsin(c*x)^2*(-c^2*x^2+1
)^(1/2)+1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^
4-5*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)*x^3-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2
)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*x^2*(-c^2*x^2+1)^(1/2)
+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x
^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*
x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)*x^5-I*b^2*(-d*(c^2*x^
2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^3*(-c^2*x^2+
1)^(1/2)*x^6-1/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^3/(c
^2*x^2-1)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b^2*(-d*(c^2*x^2-1))^(1/
2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)*x^4+b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^
4-5*c^2*x^2+1)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+2/3*b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^
2*x^2+1)^(1/2))^2)+2*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10
*c^4*x^4-5*c^2*x^2+1)*c^4*arcsin(c*x)*x^7-a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3
*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4-2*a*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*
arcsin(c*x)*x^5+a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*
x^4-5*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x^2+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)/c^3/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/3
*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2
+1)*c^4*x^7+2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^
4*x^4-5*c^2*x^2+1)*c^2*x^5-2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-
9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+b^2*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*x
^5+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2
*x^2+1)*arcsin(c*x)^2*x^3-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c
^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(
3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3+1/3*b^2*(-d*(c
^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^2*(-c^2
*x^2+1)*x-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^
4-5*c^2*x^2+1)/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/3*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*(-c^2*x^2+1)*x^5
+b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1
)*c^4*arcsin(c*x)^2*x^7-b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6
+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)^2*x^5+1/3*I*b^2*(-d*(c^2*x^2-1))^(
1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2
)-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^
2*x^2+1)*arcsin(c*x)*x^3+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^
6*x^6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)*x^3-1/3*a*b*(-d*(c^2*x^2-1))^(1/2
```

```
)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2)-1
/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x
^2+1)*x^3
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^{2} x^{2} \arcsin\left(cx\right)^{2} + 2\, abx^{2} \arcsin\left(cx\right) + a^{2} x^{2}\right) \sqrt{-c^{2} dx^{2} + d}}{c^{6} d^{3} x^{6} - 3\, c^{4} d^{3} x^{4} + 3\, c^{2} d^{3} x^{2} - d^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2} \left(a + b \operatorname{asin}\left(cx\right)\right)^{2}}{\left(-d \left(cx - 1\right) \left(cx + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b \arcsin\left(cx\right) + a\right)^{2} x^{2}}{\left(-c^{2} dx^{2} + d\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(-c^2*d*x^2 + d)^(5/2), x)
```

3.258 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=294

$$-\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2ib\sqrt{1-c^2x^2}}{}$$

```
[Out] b^2/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^2*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*c^2*d*(d -
c^2*d*x^2)^(3/2)) + (((2*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcT
an[E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2]) - ((I/3)*b^2*Sqrt[1 -
c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2])
+ ((I/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d^2*Sq
rt[d - c^2*d*x^2])
```

Rubi [A] time = 0.217861, antiderivative size = 294, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4677, 4655, 4657, 4181, 2279, 2391, 261}

$$-\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2ib\sqrt{1-c^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] b^2/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^2*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*c^2*d*(d -
c^2*d*x^2)^(3/2)) + (((2*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcT
an[E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2]) - ((I/3)*b^2*Sqrt[1 -
c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2])
+ ((I/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d^2*Sq
rt[d - c^2*d*x^2])
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx=\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$=-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(b\sqrt{\right.}}{}$$

$$=\frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Sub}}{}$$

$$=\frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}+\frac{2ib\sqrt{1-c^2x^2}\left(a+\right.}{3c}$$

$$=\frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}+\frac{2ib\sqrt{1-c^2x^2}\left(a+\right.}{3c}$$

$$=\frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}+\frac{2ib\sqrt{1-c^2x^2}\left(a+\right.}{3c}$$

Mathematica [A] time = 1.17683, size = 461, normalized size = 1.57

$$\frac{b^2\left(-4i\left(1-c^2x^2\right)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+4i\left(1-c^2x^2\right)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)-3\sqrt{1-c^2x^2}\sin^{-1}(cx)\log\left(1-i\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (a^2*Sqrt[-(d*(-1 + c^2*x^2))])/(3*c^2*d^3*(-1 + c^2*x^2)^2) + (a*b*(8*ArcS
in[c*x] + 3*Sqrt[1 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]
 - Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[3*ArcSin[c*x]]*(Log[
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]]) - 2*Sin[2*ArcSin[c*x]]))/(12*c^2*d*(d*(1 - c^2*x^2))^(3/2)) +
 (b^2*(2 + 4*ArcSin[c*x]^2 + 2*Cos[2*ArcSin[c*x]] - 3*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[
1 - I*E^(I*ArcSin[c*x])] + 3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*A
rcSin[c*x])] + ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])]
- (4*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*(1 -
 c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*ArcSin[c*x]*Sin[2*ArcSi
n[c*x]]))/(12*c^2*d*(d*(1 - c^2*x^2))^(3/2))
```

Maple [B] time = 0.187, size = 762, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 1/3*a^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*
x^4-2*c^2*x^2+1)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-1/3*b^2*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c
^4*x^4-2*c^2*x^2+1)/c^2*arcsin(c*x)^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c
^4*x^4-2*c^2*x^2+1)/c^2+1/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)
/c^2/d^3/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/3*I*b^2*(-c^2*
x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^3/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-
c^2*x^2+1)^(1/2)))-1/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^
3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/3*b^2*(-c^2*
x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c
^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^
4-2*c^2*x^2+1)/c^2*arcsin(c*x)-1/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+1/3*a*b*(-c^2*x^2+
1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(
1/2)+I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\sqrt{d}\int\frac{\left(b^2x\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2\,abx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right)\sqrt{cx+1}\sqrt{-cx+1}}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3}\,dx+\frac{a^2}{3\left(-c^2dx^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -sqrt(d)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*
a*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x) + 1/3*a^2/((-c^
2*d*x^2 + d)^(3/2)*c^2*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2x\arcsin{(cx)}^2+2\,abx\arcsin{(cx)}+a^2x\right)}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
 a^2*x)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x\left(a+b\operatorname{asin}{(cx)}\right)^2}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin{(cx)}+a\right)^2x}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/(-c^2*d*x^2 + d)^(5/2), x)
```

3.259 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=311

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}-\frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{2i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\right.}{3cd^2\sqrt{d-c^2dx^2}}$$

```
[Out] (b^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*(a + b*ArcSin[c*x]))/(3*c*d^2*Sqrt
[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^
2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) -
 (((2*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c*d^2*Sqrt[d - c^2*d*
x^2]) + (4*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[
c*x])])/(3*c*d^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*Sqrt[1 - c^2*x^2]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.276325, antiderivative size = 311, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.346, Rules used = {4655, 4653, 4675, 3719, 2190, 2279, 2391, 4677, 191}

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}-\frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{2i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\right.}{3cd^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(5/2),x]
```


```
[Out] (b^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*(a + b*ArcSin[c*x]))/(3*c*d^2*Sqrt
[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^
2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) -
 (((2*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c*d^2*Sqrt[d - c^2*d*
x^2]) + (4*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[
c*x])])/(3*c*d^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*Sqrt[1 - c^2*x^2]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d^2*Sqrt[d - c^2*d*x^2])
```


Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}dx}{3d} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^2}dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int}{3d^2\sqrt{d-}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}} -$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}} -$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}} -$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}} -$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}} -$$

Mathematica [A] time = 0.992385, size = 320, normalized size = 1.03

$$\frac{2ib^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)+2a^2c^3x^3-3a^2cx+ab\sqrt{1-c^2x^2}+2abc^2x^2\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)-2ab\sqrt{1}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-3*a^2*c*x - b^2*c*x + 2*a^2*c^3*x^3 + b^2*c^3*x^3 + a*b*Sqrt[1 - c^2*x^2]
 + b^2*(-3*c*x + 2*c^3*x^3 + (2*I)*Sqrt[1 - c^2*x^2] - (2*I)*c^2*x^2*Sqrt[1
 - c^2*x^2])*ArcSin[c*x]^2 + b*ArcSin[c*x]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt
[1 - c^2*x^2] - 4*b*(1 - c^2*x^2)^(3/2)*Log[1 + E^((2*I)*ArcSin[c*x])]) - 2
*a*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] + 2*a*b*c^2*x^2*Sqrt[1 - c^2*x^2]*L
og[1 - c^2*x^2] + (2*I)*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin
[c*x])])/(3*c*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [B] time = 0.205, size = 2896, normalized size = 9.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -10/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*
c^2*arcsin(c*x)*(-c^2*x^2+1)*x^3+14/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c
```

```
^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^2-2*I*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*arcs
in(c*x)^2*(-c^2*x^2+1)^(1/2)*x^4+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*
x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x-4*b^2*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)^2*x+2/3*b^2*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7-3*b^2*(-d*(c^2*x^
2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5+13/3*b^2*(-d*(c
^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3+16/3*I*b^2
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(
c*x)*x^3-14/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2
*x^2-4)*c^4*arcsin(c*x)*x^5-I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*
c^4*x^4+11*c^2*x^2-4)*c^3*(-c^2*x^2+1)^(1/2)*x^4-b^2*(-d*(c^2*x^2-1))^(1/2)
/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x
^2-4/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^3/(c^2*x^2-1)*arcs
in(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(
-c^2*x^2+1)^(1/2)/c/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+4/3*
I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^
7-14/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)
*c^4*x^5+16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2
*x^2-4)*c^2*x^3+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11
*c^2*x^2-4)*(-c^2*x^2+1)*x+34/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-1
0*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3-4*a*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^5-a*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2+
2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcs
in(c*x)*(-c^2*x^2+1)*x+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c
^4*x^4+11*c^2*x^2-4)*c^6*arcsin(c*x)*x^7+2/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(
c^2*x^2-1))^(1/2)/c/d^3/(c^2*x^2-1)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2
)-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/
c*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/c/d^3/(c^2*x^2-1)*arcsin(c*x)^2+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2
)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*x^2*(-c^2*x^2+1)^(1/2)+8/3*I*a*
b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^3/(c^2*x^2-1)*arcsin(c*x)+4
/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4
*(-c^2*x^2+1)*x^5-10/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x
^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*x^3-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+4/3*I
*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arc
sin(c*x)*(-c^2*x^2+1)*x^5-2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^
4*x^4+11*c^2*x^2-4)*x+28/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c
^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2-4*I*a*b*(-d*(c^2*
x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)*x^4+1/3*a^2/d*x/(-c^2*d*x^2+d)^(3/2)+2/3*a^2/d^2*x/(-c^2*d*x^
2+d)^(1/2)+4/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*
x^2-4)/c*(-c^2*x^2+1)^(1/2)-8*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*
c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x-2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c
^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6
*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^5+4/3*b^2*(-d*(c^2*x^2-1))
^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)-4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)
*c^2*(-c^2*x^2+1)*x^3-2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^
4+11*c^2*x^2-4)*c^4*arcsin(c*x)^2*x^5+17/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(
3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)^2*x^3-2*I*b^2*(-d*(c^2*x
^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x-4/3*I*b^
2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^
2+1)^(1/2)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(-c^2*d*x^2 + d)^(5/2), x)
```

3.260 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=577

$$\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{7ib}{}$$

```
[Out] b^2/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1
 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*d*(d - c^2*d*x^
2)^(3/2)) + (a + b*ArcSin[c*x])^2/(d^2*Sqrt[d - c^2*d*x^2]) + (((14*I)/3)*b
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d^2*Sqrt
[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*
ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) -
(((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d^2*S
qrt[d - c^2*d*x^2]) + (((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (2*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x
^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d
- c^2*d*x^2])
```

Rubi [A] time = 0.860139, antiderivative size = 577, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {4705, 4713, 4709, 4183, 2531, 2282, 6589, 4657, 4181, 2279, 2391, 4655, 261}

$$\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{7ib}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(5/2)),x]
```


```
[Out] b^2/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1
 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*d*(d - c^2*d*x^
2)^(3/2)) + (a + b*ArcSin[c*x])^2/(d^2*Sqrt[d - c^2*d*x^2]) + (((14*I)/3)*b
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d^2*Sqrt
[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*
ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) -
(((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d^2*S
qrt[d - c^2*d*x^2]) + (((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (2*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x
^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d
- c^2*d*x^2])
```


Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
```

```
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{3/2}}\,dx}{d} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d-c^2dx^2}}\,dx}{d^2} - \frac{(}{}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-}}{}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{}}{}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{}}{}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{}}{}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{}}{}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{}}{}$$

Mathematica [A] time = 8.64443, size = 935, normalized size = 1.62

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(a^2/(3*d^3*(-1 + c^2*x^2)^2) - a^2/(d^3*(-1 + c^
2*x^2))) + (a^2*Log[c*x])/d^(5/2) - (a^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2
*x^2))]])/d^(5/2) + (b^2*(1 - c^2*x^2)^(3/2)*(4 - ((-2 + ArcSin[c*x])*ArcSi
n[c*x])/(-1 + c*x) + 14*ArcSin[c*x]^2 + 12*ArcSin[c*x]^2*(Log[1 - E^(I*ArcS
in[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) - 28*(ArcSin[c*x]*(Log[1 - I*E^(I*A
rcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcS
in[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])])) + (24*I)*ArcSin[c*x]*(PolyLog
[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) + 24*(-PolyLog[3,
-E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])]) + (2*ArcSin[c*x]^2*Sin
[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (2*(2 + 7*Ar
cSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])
- (2*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2])^3 + (ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2])^2 - (2*(2 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/
2] + Sin[ArcSin[c*x]/2])))/(12*d*(d*(1 - c^2*x^2))^(3/2)) + (a*b*(20*ArcSin
[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x
]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - E^(
I*ArcSin[c*x])] - 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x]
```

```
)] - 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*ArcSin[c*x])] + 21*Sqrt[
1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 7*Cos[3*ArcSin[
c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 21*Sqrt[1 - c^2*x^2]*L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 7*Cos[3*ArcSin[c*x]]*Log[Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2
, -E^(I*ArcSin[c*x])] - (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, E^(I*ArcSin[c
*x])] - 2*Sin[2*ArcSin[c*x]]))/(12*d*(d*(1 - c^2*x^2))^(3/2))
```

Maple [B] time = 0.319, size = 1373, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 1/3*a^2/d/(-c^2*d*x^2+d)^(3/2)+a^2/d^2/(-c^2*d*x^2+d)^(1/2)-a^2/d^(5/2)*ln(
(2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-7/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c
^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-b^2*
(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)^2*x^2*c^2+b^2*(-c^2*x^
2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+
(-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*
x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-7/3*b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*
x^2+1)^(1/2)))+7/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x
^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7/3*I*b^2*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)
^(1/2)))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*
arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))-14/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*
x^2-1)*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2
*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-2*I*a*b*(-c^
2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(1+I*c*x+(-c^2*x
^2+1)^(1/2))-2*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)*x^2
*c^2-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)*x*
c+2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*
x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x
^2-1)^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x*c+4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d
^3/(c^2*x^2-1)^2*arcsin(c*x)^2-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-
1)^2*c^2*x^2+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1
)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/d^3/(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+8/3*a*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)+1/3*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(c^2*x^2-1)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^6d^3x^7-3\,c^4d^3x^5+3\,c^2d^3x^3-d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x), x)
```

3.261 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=452

$$-\frac{5ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+8c^2$$

```
[Out] (b^2*c^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(d*x*(d - c^
2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2
)) + (8*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/
3)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (
4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) + (16*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*
Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((5*I)/3)*b^
2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2
*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d
^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 0.616969, antiderivative size = 452, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 14, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.483, Rules used = {4701, 4655, 4653, 4675, 3719, 2190, 2279, 2391, 4677, 191, 4705, 4679, 4419, 4183}

$$-\frac{5ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+8c^2$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```


```
[Out] (b^2*c^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(d*x*(d - c^
2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2
)) + (8*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/
3)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (
4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) + (16*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*
Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((5*I)/3)*b^
2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2
*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d
^2*Sqrt[d - c^2*d*x^2])
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
```

```
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
```

```
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \left(4c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(1-c^2x^2\right)^2}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(8c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}}{3d}$$

$$= -\frac{b^2c^2x}{d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} +$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} +$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} +$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} +$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} +$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} +$$

Mathematica [A] time = 2.58508, size = 352, normalized size = 0.78

$$-\frac{c\left(-b^2\left(1-c^2x^2\right)^{3/2}\left(-5i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)-3i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{cx}{\sqrt{1-c^2x^2}}-\frac{3\sqrt{1-c^2x^2}\sin^{-1}(cx)^2}{cx}+\frac{5cx\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(c*((a^2*(3 - 12*c^2*x^2 + 8*c^4*x^4))/(c*x) + (2*a*b*(3 - 12*c^2*x^2 + 8*
c^4*x^4)*ArcSin[c*x])/(c*x) + a*b*Sqrt[1 - c^2*x^2]*(1 + 6*(-1 + c^2*x^2)*L
og[c*x] + 5*(-1 + c^2*x^2)*Log[1 - c^2*x^2]) - b^2*(1 - c^2*x^2)^(3/2)*((c*
x)/Sqrt[1 - c^2*x^2] + ArcSin[c*x]/(-1 + c^2*x^2) - (8*I)*ArcSin[c*x]^2 + (
c*x*ArcSin[c*x]^2)/(1 - c^2*x^2)^(3/2) + (5*c*x*ArcSin[c*x]^2)/Sqrt[1 - c^2
*x^2] - (3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c*x) + 6*ArcSin[c*x]*Log[1 - E
^((2*I)*ArcSin[c*x])] + 10*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - (5*
I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (3*I)*PolyLog[2, E^((2*I)*ArcSin[c*
x])])))/(3*d*(d - c^2*d*x^2)^(3/2))
```

Maple [B] time = 0.316, size = 3777, normalized size = 8.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] 136/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*
x^2*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3+56*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c
^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)^2*c^4-44*b^2*(-d*(c^2*x
^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)^2*c^2+3*
b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)*c-88/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*
x^4+26*c^2*x^2-9)/d^3*x^5*(-c^2*x^2+1)*c^6+32/3*b^2*(-d*(c^2*x^2-1))^(1/2)/
(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*(-c^2*x^2+1)*c^8-8*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2+8
0/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*
(-c^2*x^2+1)*c^4-3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^
2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*c+18*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-
25*c^4*x^4+26*c^2*x^2-9)/d^3/x*arcsin(c*x)+3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*
c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*c-128/3*I*a*b*(-d*(
c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^4*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)*c^5+272/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*
x^4+26*c^2*x^2-9)/d^3*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+8*I*a*b*(-d*(c
^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*c^2-128/3*a*b*(-
d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x
)*c^6+112*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3*x^3*arcsin(c*x)*c^4-8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+
26*c^2*x^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2)*c^3-88*a*b*(-d*(c^2*x^2-1))^(1/2)/
(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)*c^2-2*a*b*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2)
)^2-1)*c-10/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)
*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*
c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^9*c^10-224/3*I*a*b*(-d*(c^2*x^2-1))^
(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*c^8+280/3*I*a*b*(-d*(c^2*
x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*c^6-48*I*a*b*(-d*
(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*c^4-8/3*I*b^
2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^4*(-c^2*
x^2+1)^(1/2)*c^5-48*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c
^2*x^2-9)/d^3*x^3*arcsin(c*x)*c^4-24*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^
6-25*c^4*x^4+26*c^2*x^2-9)/d^3*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c-224/3*I*b
^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*arcsi
n(c*x)*c^8+17/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x
^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2)*c^3+8*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*
x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)*c^2+16/3*I*b^2*(-c^2*x^2+1)^
(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)^2+2*I*b^2*(-c^2*
x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*polylog(2,-I*c*x-(-c^
2*x^2+1)^(1/2))+5/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^
2*x^2-1)*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*I*b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*polylog(2,I*c*x+(-c^2*x^2+1)^(
1/2))+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)
/d^3*x^9*arcsin(c*x)*c^10+280/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*
c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)*c^6-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))-8/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3
*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3-10/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2
))^2)-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*arc
sin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-a^2/d/x/(-c^2*d*x^2+d)^(3/2)+32/3*b
^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^9*c^10-
40*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*c
^8+160/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3
```

```
*x^5*c^6-29*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/
d^3*x^3*c^4+5*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9
)/d^3*x*c^2+9*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9
)/d^3/x*arcsin(c*x)^2+4/3*a^2*c^2/d*x/(-c^2*d*x^2+d)^(3/2)-8*I*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)*(-c^2*
x^2+1)*c^2+40*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2
-9)/d^3*x^3*(-c^2*x^2+1)*c^4-8*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c
^4*x^4+26*c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2+32/3*I*a*b*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*c-48*I*a*b*(-d*(c^2*x^2-1
))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)*c+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9
)/d^3*x^7*(-c^2*x^2+1)*c^8-160/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25
*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*(-c^2*x^2+1)*c^6+40*I*b^2*(-d*(c^2*x^2-1))^(
1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)*(-c^2*x^2+1)*c
^4-64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3*x^4*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5-160/3*I*b^2*(-d*(c^2*x^2-1))^(1/
2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)*(-c^2*x^2+1)*c^6
+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*
x^7*arcsin(c*x)*(-c^2*x^2+1)*c^8-64/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6
-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)^2*c^6+8/3*a^2*c^2/d^2*x/(-c^2
*d*x^2+d)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^6d^3x^8-3\,c^4d^3x^6+3\,c^2d^3x^4-d^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(-c^2dx^2 + d)^{\frac{5}{2}} x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^2), x)
```

3.262 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=752

$$\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{13}{}$$

```
[Out] (b^2*c^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (2*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d
^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x])^2)/(
6*d*(d - c^2*d*x^2)^(3/2)) - (a + b*ArcSin[c*x])^2/(2*d*x^2*(d - c^2*d*x^2)
^(3/2)) + (5*c^2*(a + b*ArcSin[c*x])^2)/(2*d^2*Sqrt[d - c^2*d*x^2]) + (((26
*I)/3)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])
])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (b^2*c^2*Sqrt[1
- c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d^2*Sqrt[d - c^2*d*x^2]) + ((5*I)*b
*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/
(d^2*Sqrt[d - c^2*d*x^2]) - (((13*I)/3)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2
, (-I)*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (((13*I)/3)*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]
) - ((5*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcS
in[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog
[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (5*b^2*c^2*Sqrt[1 - c^
2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] time = 1.25643, antiderivative size = 752, normalized size of antiderivative = 1., number of steps used = 39, number of rules used = 18, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.621, Rules used = {4701, 4705, 4713, 4709, 4183, 2531, 2282, 6589, 4657, 4181, 2279, 2391, 4655, 261, 266, 51, 63, 208}

$$\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{5ibc^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{13}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (b^2*c^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (2*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d
^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x])^2)/(
6*d*(d - c^2*d*x^2)^(3/2)) - (a + b*ArcSin[c*x])^2/(2*d*x^2*(d - c^2*d*x^2)
^(3/2)) + (5*c^2*(a + b*ArcSin[c*x])^2)/(2*d^2*Sqrt[d - c^2*d*x^2]) + (((26
*I)/3)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])
])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (b^2*c^2*Sqrt[1
- c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d^2*Sqrt[d - c^2*d*x^2]) + ((5*I)*b
*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/
(d^2*Sqrt[d - c^2*d*x^2]) - (((13*I)/3)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2
, (-I)*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (((13*I)/3)*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]
) - ((5*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcS
in[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog
```

```
[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (5*b^2*c^2*Sqrt[1 - c^
2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4713

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(
(f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&  !GtQ[d, 0] && (Integ
erQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}}+\frac{1}{2}\left(5c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{5/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(1-c^2x^2\right)^2}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(cx)\right)^2}{6d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(5c^2\right)\int \frac{(a+b\sin\cdots}{x(d-c\cdots}}{2d\cdots}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(cx)\right)^2}{6d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(a+b\,\mathrm{s}\cdots\right.}{2dx^2\left(d\cdots\right.}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(\cdots\right.}{6d\left(d-c^2dx^2\right)\cdots}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(\cdots\right.}{6d\left(d-c^2dx^2\right)\cdots}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(\cdots\right.}{6d\left(d-c^2dx^2\right)\cdots}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(\cdots\right.}{6d\left(d-c^2dx^2\right)\cdots}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(\cdots\right.}{6d\left(d-c^2dx^2\right)\cdots}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc\left(a+b\sin^{-1}(cx)\right)}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2\left(a+b\sin^{-1}(\cdots\right.}{6d\left(d-c^2dx^2\right)\cdots}$$

Mathematica [A] time = 10.64, size = 1090, normalized size = 1.45

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-a^2/(2*d^3*x^2) + (a^2*c^2)/(3*d^3*(-1 + c^2*x^
2)^2) - (2*a^2*c^2)/(d^3*(-1 + c^2*x^2))) + (5*a^2*c^2*Log[x])/(2*d^(5/2))
- (5*a^2*c^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/(2*d^(5/2)) + (a*b
*c^2*Sqrt[1 - c^2*x^2]*((-2*(-1 + ArcSin[c*x]))/(-1 + c*x) + 52*ArcSin[c*x]
 - 6*Cot[ArcSin[c*x]/2] - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 60*ArcSin[c*
x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + 52*Log[Cos[A
rcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSi
n[c*x]/2]] + (60*I)*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSi
n[c*x])]) + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + (4*ArcSin[c*x]*Sin[ArcSin[
c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (52*ArcSin[c*x]*Sin[
ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x]*
Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*(1 + A
rcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (52*ArcSin[c*x]*
Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*Tan[ArcSi
n[c*x]/2]))/(12*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*Sqrt[1 - c^2*x^2]*(8
- (2*(-2 + ArcSin[c*x])*ArcSin[c*x]))/(-1 + c*x) + 52*ArcSin[c*x]^2 - 12*Arc
Sin[c*x]*Cot[ArcSin[c*x]/2] - 3*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 + 24*Log
[Tan[ArcSin[c*x]/2]] - 104*(ArcSin[c*x]*(Log[1 - I*E^(I*ArcSin[c*x])] - Log
[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - PolyLo
g[2, I*E^(I*ArcSin[c*x])])) + 60*(ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])]
 - Log[1 + E^(I*ArcSin[c*x])]) + (2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin
[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) + 2*(-PolyLog[3, -E^(I*ArcSin[c*x]
)] + PolyLog[3, E^(I*ArcSin[c*x])])) + 3*ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2
 + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2])^3 + (4*(2 + 13*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[Ar
cSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (4*(2 + 13*ArcSin[c*x]^2)*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 12*ArcSin[c*x]*Tan[Ar
cSin[c*x]/2]))/(24*d^2*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] time = 0.468, size = 1876, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] -5/2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*arcsin(c*x)^2
*c^4+b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))+5*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/
d^3/(c^2*x^2-1)*c^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-5*b^2*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*polylog(3,I*c*x+(-c^2*x^2
+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^
2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+20/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x
^4-2*c^2*x^2+1)*arcsin(c*x)*c^2-a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c
^2*x^2+1)/x^2*arcsin(c*x)+5*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d
```

```
^3/(c^2*x^2-1)*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-26/3*I*a*b*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arctan(I*c*x+(-
c^2*x^2+1)^(1/2))-5*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^
2*x^2-1)*c^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-5*I*a*b*(-c^2*x^2+1)^(1/2)*(-d
*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-5
*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arcsin
(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+5*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(
c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2
+1)^(1/2))-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*c^4
+10/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^
2-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x^2*arcsin(c*x)^
2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2+5/2*b^2*(-c^
2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arcsin(c*x)^2*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2))-5/2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/
2)/d^3/(c^2*x^2-1)*c^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-13/3*b^
2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arcsin(c*x)
*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+13/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+13/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^
2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-13/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(
c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
-5*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*arcsin(c*x)*c^4
+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x*(-c^2*x^2+1)^(1
/2)*c^3-a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x*(-c^2*x^2+1)
^(1/2)*c+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^3-b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x
^2+1)/x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+5/6*a^2*c^2/d/(-c^2*d*x^2+d)^(3/2)
+5/2*a^2*c^2/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*a^2*c^2/d^(5/2)*ln((2*d+2*d^(1/2)
*(-c^2*d*x^2+d)^(1/2))/x)-1/2*a^2/d/x^2/(-c^2*d*x^2+d)^(3/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^6d^3x^9-3\,c^4d^3x^7+3\,c^2d^3x^5-d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2}{(-c^2dx^2 + d)^{\frac{5}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^3), x)
```

3.263 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=538

$$-\frac{8ib^2c^3\sqrt{1-c^2x^2}\mathrm{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{8ib^2c^3\sqrt{1-c^2x^2}\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{16c^4x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}}-\cdots$$

```
[Out] -(b^2*c^2)/(3*d^2*x*Sqrt[d - c^2*d*x^2]) + (2*b^2*c^4*x)/(3*d^2*Sqrt[d - c^
2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d -
 c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(3*d*x^3*(d - c^2*d*x^2)^(3/2)) - (2*c
^2*(a + b*ArcSin[c*x])^2)/(d*x*(d - c^2*d*x^2)^(3/2)) + (8*c^4*x*(a + b*Arc
Sin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x*(a + b*ArcSin[c*x])^2)
/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((16*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (32*b*c^3*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) +
 (32*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*
x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*b^
2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^
2*d*x^2])
```

Rubi [A] time = 1.05303, antiderivative size = 538, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.517, Rules used = {4701, 4655, 4653, 4675, 3719, 2190, 2279, 2391, 4677, 191, 4705, 4679, 4419, 4183, 271}

$$-\frac{8ib^2c^3\sqrt{1-c^2x^2}\mathrm{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{8ib^2c^3\sqrt{1-c^2x^2}\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{16c^4x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -(b^2*c^2)/(3*d^2*x*Sqrt[d - c^2*d*x^2]) + (2*b^2*c^4*x)/(3*d^2*Sqrt[d - c^
2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d -
 c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(3*d*x^3*(d - c^2*d*x^2)^(3/2)) - (2*c
^2*(a + b*ArcSin[c*x])^2)/(d*x*(d - c^2*d*x^2)^(3/2)) + (8*c^4*x*(a + b*Arc
Sin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x*(a + b*ArcSin[c*x])^2)
/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((16*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (32*b*c^3*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) +
 (32*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*
x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*b^
2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^
2*d*x^2])
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
```

```
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
```

```
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} + \left(2c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x^3\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2\left(a+b\sin^{-1}(cx)\right)^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \left(8c^4\right)\int \frac{\left(a+b\right.}{\left(d-\right.}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{8bc^3\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(c\right.}{3dx^3\left(d-c^2dx\right.}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} - \frac{2b^2c^4x}{d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2}{d}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - 2c$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - 2c$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - 2c$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - 2c$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc\left(a+b\sin^{-1}(cx)\right)}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - 2c$$

Mathematica [A] time = 3.58719, size = 441, normalized size = 0.82

$$\frac{b^2c^3\left(1-c^2x^2\right)^{3/2}\left(-8i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right) - 8i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) - \frac{\sqrt{1-c^2x^2}}{cx} + \frac{cx}{\sqrt{1-c^2x^2}} - \frac{8\sqrt{1-c^2x^2}\sin^{-1}(cx)^2}{cx} - \frac{\sqrt{1-}}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (-((a^2*(1 + 6*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x^6))/x^3) - (a*b*(2*(1 + 6*c^
2*x^2 - 24*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x] + c*x*Sqrt[1 - c^2*x^2]*(1 + 1
6*c^2*x^2*(-1 + c^2*x^2)*Log[c*x] + 8*c^2*x^2*(-1 + c^2*x^2)*Log[1 - c^2*x^
2])))/x^3 + b^2*c^3*(1 - c^2*x^2)^(3/2)*((c*x)/Sqrt[1 - c^2*x^2] - Sqrt[1 -
 c^2*x^2]/(c*x) - ArcSin[c*x]/(c^2*x^2) + ArcSin[c*x]/(-1 + c^2*x^2) - (16*
I)*ArcSin[c*x]^2 + (c*x*ArcSin[c*x]^2)/(1 - c^2*x^2)^(3/2) + (8*c*x*ArcSin[
c*x]^2)/Sqrt[1 - c^2*x^2] - (Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c^3*x^3) - (
8*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c*x) + 16*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] + 16*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - (8*I)*PolyL
og[2, -E^((2*I)*ArcSin[c*x])] - (8*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(
3*d*(d - c^2*d*x^2)^(3/2))
```

Maple [B] time = 0.381, size = 5229, normalized size = 9.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] result too large to display
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)}{c^6d^3x^{10}-3\,c^4d^3x^8+3\,c^2d^3x^6-d^3x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^10 - 3*c^4*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^4), x)
```

3.264 $\int \frac{x^4 \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=157

$$\frac{x^3\sqrt{1-a^2x^2}}{32a^2}+\frac{15x\sqrt{1-a^2x^2}}{64a^4}-\frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{4a^2}+\frac{3x^2\sin^{-1}(ax)}{8a^3}-\frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{8a^4}+\frac{\sin^{-1}(ax)^3}{8a^5}-15$$

```
[Out] (15*x*Sqrt[1 - a^2*x^2])/(64*a^4) + (x^3*Sqrt[1 - a^2*x^2])/(32*a^2) - (15*
ArcSin[a*x])/(64*a^5) + (3*x^2*ArcSin[a*x])/(8*a^3) + (x^4*ArcSin[a*x])/(8*
a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2)/(4*a^2) + ArcSin[a*x]^3/(8*a^5)
```

Rubi [A] time = 0.270624, antiderivative size = 157, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4707, 4641, 4627, 321, 216}

$$\frac{x^3\sqrt{1-a^2x^2}}{32a^2}+\frac{15x\sqrt{1-a^2x^2}}{64a^4}-\frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{4a^2}+\frac{3x^2\sin^{-1}(ax)}{8a^3}-\frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{8a^4}+\frac{\sin^{-1}(ax)^3}{8a^5}-15$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (15*x*Sqrt[1 - a^2*x^2])/(64*a^4) + (x^3*Sqrt[1 - a^2*x^2])/(32*a^2) - (15*
ArcSin[a*x])/(64*a^5) + (3*x^2*ArcSin[a*x])/(8*a^3) + (x^4*ArcSin[a*x])/(8*
a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2)/(4*a^2) + ArcSin[a*x]^3/(8*a^5)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
```

```
x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
+ 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^4 \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{4a^2} + \frac{3\int \frac{x^2\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{4a^2} + \frac{\int x^3\sin^{-1}(ax)\,dx}{2a}$$

$$= \frac{x^4\sin^{-1}(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{4a^2} - \frac{1}{8}\int \frac{x^4}{\sqrt{1-a^2x^2}}\,dx + \frac{3\int \frac{\sin^{-1}}{\sqrt{1-}}}{8a}$$

$$= \frac{x^3\sqrt{1-a^2x^2}}{32a^2} + \frac{3x^2\sin^{-1}(ax)}{8a^3} + \frac{x^4\sin^{-1}(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{4a^2}$$

$$= \frac{15x\sqrt{1-a^2x^2}}{64a^4} + \frac{x^3\sqrt{1-a^2x^2}}{32a^2} + \frac{3x^2\sin^{-1}(ax)}{8a^3} + \frac{x^4\sin^{-1}(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{8a^4} - \frac{x^3\sqrt{1-}}{}$$

$$= \frac{15x\sqrt{1-a^2x^2}}{64a^4} + \frac{x^3\sqrt{1-a^2x^2}}{32a^2} - \frac{15\sin^{-1}(ax)}{64a^5} + \frac{3x^2\sin^{-1}(ax)}{8a^3} + \frac{x^4\sin^{-1}(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}}{8a^4}$$

Mathematica [A] time = 0.0516752, size = 100, normalized size = 0.64

$$\frac{ax\sqrt{1-a^2x^2}\left(2a^2x^2+15\right) - 8ax\sqrt{1-a^2x^2}\left(2a^2x^2+3\right)\sin^{-1}(ax)^2 + \left(8a^4x^4+24a^2x^2-15\right)\sin^{-1}(ax) + 8\sin^{-1}(ax)^3}{64a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a*x*Sqrt[1 - a^2*x^2]*(15 + 2*a^2*x^2) + (-15 + 24*a^2*x^2 + 8*a^4*x^4)*Ar
cSin[a*x] - 8*a*x*Sqrt[1 - a^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x]^2 + 8*ArcSi
n[a*x]^3)/(64*a^5)
```

Maple [A] time = 0.063, size = 129, normalized size = 0.8

$$\frac{1}{64a^5}\left(-16\left(\arcsin(ax)\right)^2\sqrt{-a^2x^2+1}x^3a^3 + 8a^4x^4\arcsin(ax) + 2a^3x^3\sqrt{-a^2x^2+1} - 24\left(\arcsin(ax)\right)^2\sqrt{-a^2x^2+1}xa + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/64*(-16*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*x^3*a^3+8*a^4*x^4*arcsin(a*x)+2*
a^3*x^3*(-a^2*x^2+1)^(1/2)-24*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*x*a+24*a^2*x
^2*arcsin(a*x)+8*arcsin(a*x)^3+15*a*x*(-a^2*x^2+1)^(1/2)-15*arcsin(a*x))/a^
5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4 \arcsin(ax)^2}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A] time = 1.7379, size = 205, normalized size = 1.31

$$\frac{8\arcsin(ax)^3 + \left(8\,a^4x^4 + 24\,a^2x^2 - 15\right)\arcsin(ax) + \left(2\,a^3x^3 - 8\left(2\,a^3x^3 + 3\,ax\right)\arcsin(ax)^2 + 15\,ax\right)\sqrt{-a^2x^2+1}}{64\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/64*(8*arcsin(a*x)^3 + (8*a^4*x^4 + 24*a^2*x^2 - 15)*arcsin(a*x) + (2*a^3*
x^3 - 8*(2*a^3*x^3 + 3*a*x)*arcsin(a*x)^2 + 15*a*x)*sqrt(-a^2*x^2 + 1))/a^5
```

Sympy [A] time = 4.83173, size = 146, normalized size = 0.93

$$\begin{cases} \frac{x^4\operatorname{asin}(ax)}{8a} - \frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{4a^2} + \frac{x^3\sqrt{-a^2x^2+1}}{32a^2} + \frac{3x^2\operatorname{asin}(ax)}{8a^3} - \frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{8a^4} + \frac{15x\sqrt{-a^2x^2+1}}{64a^4} + \frac{\operatorname{asin}^3(ax)}{8a^5} - \frac{15\operatorname{asin}(ax)}{64a^5} \\ 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**4*asin(a*x)/(8*a) - x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(4
*a**2) + x**3*sqrt(-a**2*x**2 + 1)/(32*a**2) + 3*x**2*asin(a*x)/(8*a**3) -
3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(8*a**4) + 15*x*sqrt(-a**2*x**2 + 1)/
(64*a**4) + asin(a*x)**3/(8*a**5) - 15*asin(a*x)/(64*a**5), Ne(a, 0)), (0,
True))
```

Giac [A] time = 1.2664, size = 193, normalized size = 1.23

$$\frac{\left(-a^2x^2+1\right)^{\frac{3}{2}} x\arcsin(ax)^2}{4\,a^4} - \frac{5\sqrt{-a^2x^2+1}x\arcsin(ax)^2}{8\,a^4} - \frac{\left(-a^2x^2+1\right)^{\frac{3}{2}} x}{32\,a^4} + \frac{\left(a^2x^2-1\right)^2\arcsin(ax)}{8\,a^5} + \frac{\arcsin(ax)^3}{8\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)^2/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arc
sin(a*x)^2/a^4 - 1/32*(-a^2*x^2 + 1)^(3/2)*x/a^4 + 1/8*(a^2*x^2 - 1)^2*arcs
in(a*x)/a^5 + 1/8*arcsin(a*x)^3/a^5 + 17/64*sqrt(-a^2*x^2 + 1)*x/a^4 + 5/8*
(a^2*x^2 - 1)*arcsin(a*x)/a^5 + 17/64*arcsin(a*x)/a^5
```

3.265 $\int \frac{x^3 \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=126

$$-\frac{2\left(1-a^2x^2\right)^{3/2}}{27a^4}+\frac{14\sqrt{1-a^2x^2}}{9a^4}-\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^2}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^4}+\frac{4x\sin^{-1}(ax)}{3a^3}+\frac{2x^3\sin^{-1}(ax)}{9a}$$

```
[Out] (14*Sqrt[1 - a^2*x^2])/(9*a^4) - (2*(1 - a^2*x^2)^(3/2))/(27*a^4) + (4*x*Ar
cSin[a*x])/(3*a^3) + (2*x^3*ArcSin[a*x])/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSi
n[a*x]^2)/(3*a^4) - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(3*a^2)
```

Rubi [A] time = 0.202162, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4707, 4677, 4619, 261, 4627, 266, 43}

$$-\frac{2\left(1-a^2x^2\right)^{3/2}}{27a^4}+\frac{14\sqrt{1-a^2x^2}}{9a^4}-\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^2}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^4}+\frac{4x\sin^{-1}(ax)}{3a^3}+\frac{2x^3\sin^{-1}(ax)}{9a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```


```
[Out] (14*Sqrt[1 - a^2*x^2])/(9*a^4) - (2*(1 - a^2*x^2)^(3/2))/(27*a^4) + (4*x*Ar
cSin[a*x])/(3*a^3) + (2*x^3*ArcSin[a*x])/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSi
n[a*x]^2)/(3*a^4) - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(3*a^2)
```


Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^3 \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^2} + \frac{2\int \frac{x\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{3a^2} + \frac{2\int x^2\sin^{-1}(ax)\,dx}{3a}$$

$$= \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^2} - \frac{2}{9}\int \frac{x^3}{\sqrt{1-a^2x^2}}\,dx + \frac{4\int \text{si}$$

$$= \frac{4x\sin^{-1}(ax)}{3a^3} + \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^2} - \frac{1}{9}\text{Subst}\Big(\int$$

$$= \frac{4\sqrt{1-a^2x^2}}{3a^4} + \frac{4x\sin^{-1}(ax)}{3a^3} + \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^2}$$

$$= \frac{14\sqrt{1-a^2x^2}}{9a^4} - \frac{2\left(1-a^2x^2\right)^{3/2}}{27a^4} + \frac{4x\sin^{-1}(ax)}{3a^3} + \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3a^4} - \frac{x^2\sqrt{}}{}$$

Mathematica [A] time = 0.0453418, size = 81, normalized size = 0.64

$$\frac{2\sqrt{1-a^2x^2}\left(a^2x^2+20\right)-9\sqrt{1-a^2x^2}\left(a^2x^2+2\right)\sin^{-1}(ax)^2+6ax\left(a^2x^2+6\right)\sin^{-1}(ax)}{27a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*(20 + a^2*x^2) + 6*a*x*(6 + a^2*x^2)*ArcSin[a*x] - 9*S
qrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin[a*x]^2)/(27*a^4)
```

Maple [A] time = 0.055, size = 127, normalized size = 1.

$$-\frac{1}{27\,a^4\left(a^2x^2-1\right)}\Big(9\,a^4x^4\left(\arcsin(ax)\right)^2+9\,\left(\arcsin(ax)\right)^2x^2a^2+6\,\arcsin(ax)\sqrt{-a^2x^2+1}x^3a^3-2\,a^4x^4-38\,a^2x^2-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/27/a^4*(9*a^4*x^4*arcsin(a*x)^2+9*arcsin(a*x)^2*x^2*a^2+6*arcsin(a*x)*(-
a^2*x^2+1)^(1/2)*x^3*a^3-2*a^4*x^4-38*a^2*x^2-18*arcsin(a*x)^2+36*arcsin(a*
x)*(-a^2*x^2+1)^(1/2)*x*a+40)*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)
```

Maxima [A] time = 1.551, size = 142, normalized size = 1.13

$$-\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}x^2}{a^2}+\frac{2\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin(ax)^2+\frac{2\left(\sqrt{-a^2x^2+1}x^2+\frac{20\sqrt{-a^2x^2+1}}{a^2}\right)}{27a^2}+\frac{2\left(a^2x^3+6x\right)\arcsin(ax)}{9a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x^2 + 1)/a^4)*arcsin(a*x)^2
+ 2/27*(sqrt(-a^2*x^2 + 1)*x^2 + 20*sqrt(-a^2*x^2 + 1)/a^2)/a^2 + 2/9*(a^2*
x^3 + 6*x)*arcsin(a*x)/a^3
```

Fricas [A] time = 1.78503, size = 154, normalized size = 1.22

$$\frac{6\left(a^3x^3+6ax\right)\arcsin(ax)+\left(2a^2x^2-9\left(a^2x^2+2\right)\arcsin(ax)^2+40\right)\sqrt{-a^2x^2+1}}{27a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/27*(6*(a^3*x^3 + 6*a*x)*arcsin(a*x) + (2*a^2*x^2 - 9*(a^2*x^2 + 2)*arcsin
(a*x)^2 + 40)*sqrt(-a^2*x^2 + 1))/a^4
```

Sympy [A] time = 2.70067, size = 121, normalized size = 0.96

$$\begin{cases}\frac{2x^3\operatorname{asin}(ax)}{9a}-\frac{x^2\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{3a^2}+\frac{2x^2\sqrt{-a^2x^2+1}}{27a^2}+\frac{4x\operatorname{asin}(ax)}{3a^3}-\frac{2\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{3a^4}+\frac{40\sqrt{-a^2x^2+1}}{27a^4} & \text{for } a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((2*x**3*asin(a*x)/(9*a) - x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/
(3*a**2) + 2*x**2*sqrt(-a**2*x**2 + 1)/(27*a**2) + 4*x*asin(a*x)/(3*a**3) -
 2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(3*a**4) + 40*sqrt(-a**2*x**2 + 1)/(27
*a**4), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.227, size = 138, normalized size = 1.1

$$\frac{\left(\left(-a^2x^2+1\right)^{\frac{3}{2}}-3\sqrt{-a^2x^2+1}\right)\arcsin\left(ax\right)^2}{3\,a^4}+\frac{2\left(3\left(a^2x^2-1\right)x\arcsin\left(ax\right)+21\,x\arcsin\left(ax\right)-\frac{\left(-a^2x^2+1\right)^{\frac{3}{2}}}{a}+\frac{21\sqrt{-a^2x^2+1}}{a}\right)}{27\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/3*((-a^2*x^2 + 1)^(3/2) - 3*sqrt(-a^2*x^2 + 1))*arcsin(a*x)^2/a^4 + 2/27*
(3*(a^2*x^2 - 1)*x*arcsin(a*x) + 21*x*arcsin(a*x) - (-a^2*x^2 + 1)^(3/2)/a
+ 21*sqrt(-a^2*x^2 + 1)/a)/a^3
```

3.266 $\int \frac{x^2 \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=89

$$\frac{x\sqrt{1-a^2x^2}}{4a^2} - \frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2a^2} + \frac{\sin^{-1}(ax)^3}{6a^3} - \frac{\sin^{-1}(ax)}{4a^3} + \frac{x^2\sin^{-1}(ax)}{2a}$$

```
[Out] (x*Sqrt[1 - a^2*x^2])/(4*a^2) - ArcSin[a*x]/(4*a^3) + (x^2*ArcSin[a*x])/(2*
a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*a^2) + ArcSin[a*x]^3/(6*a^3)
```

Rubi [A] time = 0.137485, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4707, 4641, 4627, 321, 216}

$$\frac{x\sqrt{1-a^2x^2}}{4a^2} - \frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2a^2} + \frac{\sin^{-1}(ax)^3}{6a^3} - \frac{\sin^{-1}(ax)}{4a^3} + \frac{x^2\sin^{-1}(ax)}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x*Sqrt[1 - a^2*x^2])/(4*a^2) - ArcSin[a*x]/(4*a^3) + (x^2*ArcSin[a*x])/(2*
a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*a^2) + ArcSin[a*x]^3/(6*a^3)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx &= -\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2a^2}+\frac{\int \frac{\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{2a^2}+\frac{\int x\sin^{-1}(ax)\,dx}{a}\\
&= \frac{x^2\sin^{-1}(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2a^2}+\frac{\sin^{-1}(ax)^3}{6a^3}-\frac{1}{2}\int \frac{x^2}{\sqrt{1-a^2x^2}}\,dx\\
&= \frac{x\sqrt{1-a^2x^2}}{4a^2}+\frac{x^2\sin^{-1}(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2a^2}+\frac{\sin^{-1}(ax)^3}{6a^3}-\frac{\int \frac{1}{\sqrt{1-a^2x^2}}\,dx}{4a^2}\\
&= \frac{x\sqrt{1-a^2x^2}}{4a^2}-\frac{\sin^{-1}(ax)}{4a^3}+\frac{x^2\sin^{-1}(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2a^2}+\frac{\sin^{-1}(ax)^3}{6a^3}
\end{aligned}
$$

Mathematica [A] time = 0.024274, size = 73, normalized size = 0.82

$$
\frac{3ax\sqrt{1-a^2x^2}-6ax\sqrt{1-a^2x^2}\sin^{-1}(ax)^2+\left(6a^2x^2-3\right)\sin^{-1}(ax)+2\sin^{-1}(ax)^3}{12a^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (3*a*x*Sqrt[1 - a^2*x^2] + (-3 + 6*a^2*x^2)*ArcSin[a*x] - 6*a*x*Sqrt[1 - a^
2*x^2]*ArcSin[a*x]^2 + 2*ArcSin[a*x]^3)/(12*a^3)
```

Maple [A] time = 0.062, size = 71, normalized size = 0.8

$$
\frac{1}{12\,a^3}\left(-6\,\left(\arcsin\left(ax\right)\right)^2\sqrt{-a^2x^2+1}xa+6\,a^2x^2\arcsin\left(ax\right)+2\,\left(\arcsin\left(ax\right)\right)^3+3\,ax\sqrt{-a^2x^2+1}-3\,\arcsin\left(ax\right)\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/12*(-6*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*x*a+6*a^2*x^2*arcsin(a*x)+2*arcsi
n(a*x)^3+3*a*x*(-a^2*x^2+1)^(1/2)-3*arcsin(a*x))/a^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$
\int \frac{x^2\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A] time = 1.73193, size = 150, normalized size = 1.69

$$\frac{2 \arcsin(ax)^3 + 3\left(2a^2x^2 - 1\right)\arcsin(ax) - 3\sqrt{-a^2x^2+1}\left(2ax\arcsin(ax)^2 - ax\right)}{12a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/12*(2*arcsin(a*x)^3 + 3*(2*a^2*x^2 - 1)*arcsin(a*x) - 3*sqrt(-a^2*x^2 + 1
)*(2*a*x*arcsin(a*x)^2 - a*x))/a^3
```

Sympy [A] time = 1.50168, size = 78, normalized size = 0.88

$$\begin{cases} \frac{x^2 \operatorname{asin}(ax)}{2a} - \frac{x\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{2a^2} + \frac{x\sqrt{-a^2x^2+1}}{4a^2} + \frac{\operatorname{asin}^3(ax)}{6a^3} - \frac{\operatorname{asin}(ax)}{4a^3} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**2*asin(a*x)/(2*a) - x*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(2*a*
*2) + x*sqrt(-a**2*x**2 + 1)/(4*a**2) + asin(a*x)**3/(6*a**3) - asin(a*x)/(
4*a**3), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.24809, size = 109, normalized size = 1.22

$$-\frac{\sqrt{-a^2x^2+1}x\arcsin(ax)^2}{2a^2} + \frac{\arcsin(ax)^3}{6a^3} + \frac{\sqrt{-a^2x^2+1}x}{4a^2} + \frac{\left(a^2x^2-1\right)\arcsin(ax)}{2a^3} + \frac{\arcsin(ax)}{4a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^2/a^2 + 1/6*arcsin(a*x)^3/a^3 + 1/4*s
qrt(-a^2*x^2 + 1)*x/a^2 + 1/2*(a^2*x^2 - 1)*arcsin(a*x)/a^3 + 1/4*arcsin(a*
x)/a^3
```

3.267 $\int \frac{x \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=55

$$\frac{2\sqrt{1-a^2x^2}}{a^2} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a^2} + \frac{2x\sin^{-1}(ax)}{a}$$

```
[Out] (2*Sqrt[1 - a^2*x^2])/a^2 + (2*x*ArcSin[a*x])/a - (Sqrt[1 - a^2*x^2]*ArcSin
[a*x]^2)/a^2
```

Rubi [A] time = 0.0719107, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4677, 4619, 261}

$$\frac{2\sqrt{1-a^2x^2}}{a^2} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a^2} + \frac{2x\sin^{-1}(ax)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2])/a^2 + (2*x*ArcSin[a*x])/a - (Sqrt[1 - a^2*x^2]*ArcSin
[a*x]^2)/a^2
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a^2} + \frac{2\int \sin^{-1}(ax)\,dx}{a}\\
&= \frac{2x\sin^{-1}(ax)}{a} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a^2} - 2\int \frac{x}{\sqrt{1-a^2x^2}}\,dx\\
&= \frac{2\sqrt{1-a^2x^2}}{a^2} + \frac{2x\sin^{-1}(ax)}{a} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a^2}
\end{aligned}$$

Mathematica [A] time = 0.0127663, size = 51, normalized size = 0.93

$$\frac{2\sqrt{1-a^2x^2}-\sqrt{1-a^2x^2}\sin^{-1}(ax)^2+2ax\sin^{-1}(ax)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2] + 2*a*x*ArcSin[a*x] - Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)
/a^2
```

Maple [A] time = 0.044, size = 80, normalized size = 1.5

$$-\frac{1}{a^2\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}\left((\arcsin(ax))^2x^2a^2-(\arcsin(ax))^2+2\arcsin(ax)\sqrt{-a^2x^2+1}xa-2a^2x^2+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(arcsin(a*x)^2*x^2*a^2-arcsin(a*x)^2+
2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x*a-2*a^2*x^2+2)
```

Maxima [A] time = 1.49674, size = 66, normalized size = 1.2

$$-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^2}{a^2}+\frac{2\left(ax\arcsin(ax)+\sqrt{-a^2x^2+1}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/a^2 + 2*(a*x*arcsin(a*x) + sqrt(-a^2*x^2
+ 1))/a^2
```

Fricas [A] time = 1.6864, size = 89, normalized size = 1.62

$$\frac{2ax\arcsin(ax)-\sqrt{-a^2x^2+1}\left(\arcsin(ax)^2-2\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (2*a*x*arcsin(a*x) - sqrt(-a^2*x^2 + 1)*(arcsin(a*x)^2 - 2))/a^2
```

Sympy [A] time = 0.87482, size = 49, normalized size = 0.89

$$\begin{cases} \frac{2x\operatorname{asin}(ax)}{a} - \frac{\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{a^2} + \frac{2\sqrt{-a^2x^2+1}}{a^2} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((2*x*asin(a*x)/a - sqrt(-a**2*x**2 + 1)*asin(a*x)**2/a**2 + 2*sqr
t(-a**2*x**2 + 1)/a**2, Ne(a, 0)), (0, True))
```

Giac [A] time = 1.27632, size = 66, normalized size = 1.2

$$-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^2}{a^2} + \frac{2\left(ax\arcsin(ax) + \sqrt{-a^2x^2+1}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/a^2 + 2*(a*x*arcsin(a*x) + sqrt(-a^2*x^2
+ 1))/a^2
```

3.268 $\int \frac{\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=13

$$\frac{\sin^{-1}(ax)^3}{3a}$$

[Out] ArcSin[a*x]^3/(3*a)

Rubi [A] time = 0.0338384, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4641}

$$\frac{\sin^{-1}(ax)^3}{3a}$$

Antiderivative was successfully verified.

[In] Int[ArcSin[a*x]^2/Sqrt[1 - a^2*x^2],x]

[Out] ArcSin[a*x]^3/(3*a)

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\sin^{-1}(ax)^3}{3a}$$

Mathematica [A] time = 0.0038623, size = 13, normalized size = 1.

$$\frac{\sin^{-1}(ax)^3}{3a}$$

Antiderivative was successfully verified.

[In] Integrate[ArcSin[a*x]^2/Sqrt[1 - a^2*x^2],x]

[Out] ArcSin[a*x]^3/(3*a)

Maple [A] time = 0.003, size = 12, normalized size = 0.9

$$\frac{(\arcsin(ax))^3}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/3*arcsin(a*x)^3/a
```

Maxima [A] time = 1.51888, size = 15, normalized size = 1.15

$$\frac{\arcsin(ax)^3}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*arcsin(a*x)^3/a
```

Fricas [A] time = 1.62441, size = 28, normalized size = 2.15

$$\frac{\arcsin(ax)^3}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*arcsin(a*x)^3/a
```

Sympy [A] time = 0.474915, size = 10, normalized size = 0.77

$$\begin{cases} \frac{\operatorname{asin}^3(ax)}{3a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((asin(a*x)**3/(3*a), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.25424, size = 15, normalized size = 1.15

$$\frac{\arcsin(ax)^3}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/3*arcsin(a*x)^3/a
```

3.269 $\int \frac{\sin^{-1}(ax)^2}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=92

$$2i\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-2i\sin^{-1}(ax)\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-2\text{PolyLog}\left(3,-e^{i\sin^{-1}(ax)}\right)+2\text{PolyLog}\left(3,e\right.$$

```
[Out] -2*ArcSin[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] + (2*I)*ArcSin[a*x]*PolyLog[2,
-E^(I*ArcSin[a*x])] - (2*I)*ArcSin[a*x]*PolyLog[2, E^(I*ArcSin[a*x])] - 2*P
olyLog[3, -E^(I*ArcSin[a*x])] + 2*PolyLog[3, E^(I*ArcSin[a*x])]
```

Rubi [A] time = 0.142958, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4709, 4183, 2531, 2282, 6589}

$$2i\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-2i\sin^{-1}(ax)\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-2\text{PolyLog}\left(3,-e^{i\sin^{-1}(ax)}\right)+2\text{PolyLog}\left(3,e\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(x*Sqrt[1 - a^2*x^2]),x]
```


```
[Out] -2*ArcSin[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] + (2*I)*ArcSin[a*x]*PolyLog[2,
-E^(I*ArcSin[a*x])] - (2*I)*ArcSin[a*x]*PolyLog[2, E^(I*ArcSin[a*x])] - 2*P
olyLog[3, -E^(I*ArcSin[a*x])] + 2*PolyLog[3, E^(I*ArcSin[a*x])]
```


Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{x\sqrt{1-a^2x^2}}\,dx = \text{Subst}\left(\int x^2\csc(x)\,dx, x, \sin^{-1}(ax)\right)$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - 2\,\text{Subst}\left(\int x\log\left(1-e^{ix}\right)\,dx, x, \sin^{-1}(ax)\right) + 2\,\text{Subst}\left(\int x\,\text{l}\right.$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 2i\sin^{-1}(ax)\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 2i\sin^{-1}(ax)\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right) - 2$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 2i\sin^{-1}(ax)\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 2i\sin^{-1}(ax)\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right) - 2$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 2i\sin^{-1}(ax)\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 2i\sin^{-1}(ax)\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right) - 2$$

Mathematica [A] time = 0.10266, size = 116, normalized size = 1.26

$$2i\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right) - 2i\sin^{-1}(ax)\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right) - 2\text{PolyLog}\left(3,-e^{i\sin^{-1}(ax)}\right) + 2\text{PolyLog}\left(\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]^2/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] ArcSin[a*x]^2*Log[1 - E^(I*ArcSin[a*x])] - ArcSin[a*x]^2*Log[1 + E^(I*ArcSi
n[a*x])] + (2*I)*ArcSin[a*x]*PolyLog[2, -E^(I*ArcSin[a*x])] - (2*I)*ArcSin[
a*x]*PolyLog[2, E^(I*ArcSin[a*x])] - 2*PolyLog[3, -E^(I*ArcSin[a*x])] + 2*P
olyLog[3, E^(I*ArcSin[a*x])]
```

Maple [A] time = 0.06, size = 161, normalized size = 1.8

$$-(\arcsin(ax))^2\ln\left(1+iax+\sqrt{-a^2x^2+1}\right) + 2\,i\arcsin(ax)\,\text{polylog}\left(2,-iax-\sqrt{-a^2x^2+1}\right) - 2\,\text{polylog}\left(3,-iax-\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -arcsin(a*x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+2*I*arcsin(a*x)*polylog(2,-I*
a*x-(-a^2*x^2+1)^(1/2))-2*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+arcsin(a*x)^
2*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-2*I*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+
1)^(1/2))+2*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{\sqrt{-a^2x^2+1}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin\left(ax\right)^2}{a^2x^3-x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^3 - x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^2\left(ax\right)}{x\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**2/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x), x)
```

3.270 $\int \frac{\sin^{-1}(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=76

$$-ia\text{PolyLog}\left(2,e^{2i\sin^{-1}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x}-ia\sin^{-1}(ax)^2+2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right)$$

```
[Out] (-I)*a*ArcSin[a*x]^2 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/x + 2*a*ArcSin[a*x
]*Log[1 - E^((2*I)*ArcSin[a*x])] - I*a*PolyLog[2, E^((2*I)*ArcSin[a*x])]
```

Rubi [A] time = 0.14353, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4681, 4625, 3717, 2190, 2279, 2391}

$$-ia\text{PolyLog}\left(2,e^{2i\sin^{-1}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x}-ia\sin^{-1}(ax)^2+2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-I)*a*ArcSin[a*x]^2 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/x + 2*a*ArcSin[a*x
]*Log[1 - E^((2*I)*ArcSin[a*x])] - I*a*PolyLog[2, E^((2*I)*ArcSin[a*x])]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x} + (2a)\int \frac{\sin^{-1}(ax)}{x}\,dx\\ &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x} + (2a)\,\text{Subst}\left(\int x\cot(x)\,dx, x, \sin^{-1}(ax)\right)\\ &= -ia\sin^{-1}(ax)^2 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x} - (4ia)\,\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \sin^{-1}(ax)\right)\\ &= -ia\sin^{-1}(ax)^2 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x} + 2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right) - (2a)\,\text{Subst}\left(\int \log\left(1-\right.\right.\\ &= -ia\sin^{-1}(ax)^2 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x} + 2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right) + (ia)\,\text{Subst}\left(\int \frac{\log(1-}{x}\right.\\ &= -ia\sin^{-1}(ax)^2 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{x} + 2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right) - ia\text{Li}_2\left(e^{2i\sin^{-1}(ax)}\right)\end{aligned}$$

Mathematica [A] time = 0.260923, size = 72, normalized size = 0.95

$$\sin^{-1}(ax)\left(2a\log\left(1-e^{2i\sin^{-1}(ax)}\right) - \frac{\left(\sqrt{1-a^2x^2}+iax\right)\sin^{-1}(ax)}{x}\right) - ia\text{PolyLog}\left(2, e^{2i\sin^{-1}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] ArcSin[a*x]*(-(((I*a*x + Sqrt[1 - a^2*x^2])*ArcSin[a*x])/x) + 2*a*Log[1 - E
^((2*I)*ArcSin[a*x])]) - I*a*PolyLog[2, E^((2*I)*ArcSin[a*x])]
```

Maple [A] time = 0.107, size = 148, normalized size = 2.

$$\frac{(\arcsin(ax))^2}{x}\left(iax-\sqrt{-a^2x^2+1}\right)+2\,a\arcsin(ax)\ln\left(1+iax+\sqrt{-a^2x^2+1}\right)+2\,a\arcsin(ax)\ln\left(1-iax-\sqrt{-a^2x^2+1}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] (I*a*x-(-a^2*x^2+1)^(1/2))/x*arcsin(a*x)^2+2*a*arcsin(a*x)*ln(1+I*a*x+(-a^2
*x^2+1)^(1/2))+2*a*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-2*I*arcsin(a*
x)^2*a-2*I*polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))*a-2*I*a*polylog(2,I*a*x+(-a
^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\sqrt{ax+1}\sqrt{-ax+1}\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)^{2}-2\,ax\int\frac{\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)}{x}\,dx}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(sqrt(a*x + 1)*sqrt(-a*x + 1)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^2
 - 2*a*x*integrate(arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))/x, x))/x
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^{2}x^{2}+1}\arcsin\left(ax\right)^{2}}{a^{2}x^{4}-x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^4 - x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{asin}^{2}\left(ax\right)}{x^{2}\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/x**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**2/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\arcsin\left(ax\right)^{2}}{\sqrt{-a^{2}x^{2}+1}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^2), x)
```

3.271 $\int \frac{\sin^{-1}(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=163

$$ia^2\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-ia^2\sin^{-1}(ax)\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-a^2\text{PolyLog}\left(3,-e^{i\sin^{-1}(ax)}\right)+a^2\text{PolyLog}\left(\right.$$

```
[Out] -((a*ArcSin[a*x])/x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*x^2) - a^2*ArcS
in[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcTanh[Sqrt[1 - a^2*x^2]] + I*a
^2*ArcSin[a*x]*PolyLog[2, -E^(I*ArcSin[a*x])] - I*a^2*ArcSin[a*x]*PolyLog[2
, E^(I*ArcSin[a*x])] - a^2*PolyLog[3, -E^(I*ArcSin[a*x])] + a^2*PolyLog[3,
E^(I*ArcSin[a*x])]
```

Rubi [A] time = 0.254875, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4701, 4709, 4183, 2531, 2282, 6589, 4627, 266, 63, 208}

$$ia^2\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-ia^2\sin^{-1}(ax)\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-a^2\text{PolyLog}\left(3,-e^{i\sin^{-1}(ax)}\right)+a^2\text{PolyLog}\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(x^3*Sqrt[1 - a^2*x^2]),x]
```


```
[Out] -((a*ArcSin[a*x])/x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*x^2) - a^2*ArcS
in[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcTanh[Sqrt[1 - a^2*x^2]] + I*a
^2*ArcSin[a*x]*PolyLog[2, -E^(I*ArcSin[a*x])] - I*a^2*ArcSin[a*x]*PolyLog[2
, E^(I*ArcSin[a*x])] - a^2*PolyLog[3, -E^(I*ArcSin[a*x])] + a^2*PolyLog[3,
E^(I*ArcSin[a*x])]
```


Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{x^3\sqrt{1-a^2x^2}}dx = -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2x^2} + a\int \frac{\sin^{-1}(ax)}{x^2}dx + \frac{1}{2}a^2\int \frac{\sin^{-1}(ax)^2}{x\sqrt{1-a^2x^2}}dx$$
$$= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2x^2} + \frac{1}{2}a^2\,\text{Subst}\left(\int x^2\csc(x)\,dx, x, \sin^{-1}(ax)\right) + a^2\int \frac{1}{x\sqrt{1-a^2x^2}}$$
$$= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + \frac{1}{2}a^2\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-a^2}}\right.$$
$$= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + ia^2\sin^{-1}(ax)\text{Li}_2\left(-e^{i\sin^{-1}}\right.$$
$$= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\tanh^{-1}\left(\sqrt{1-a^2x^2}\right) +$$
$$= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\tanh^{-1}\left(\sqrt{1-a^2x^2}\right) +$$

Mathematica [A] time = 1.33626, size = 194, normalized size = 1.19

$$\frac{1}{8}a^2\left(8i\sin^{-1}(ax)\left(\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right) - \text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)\right) + 8\left(\text{PolyLog}\left(3,e^{i\sin^{-1}(ax)}\right) - \text{PolyLog}\left(3,-e^{i\sin}\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]^2/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*(-4*ArcSin[a*x]*Cot[ArcSin[a*x]/2] - ArcSin[a*x]^2*Csc[ArcSin[a*x]/2]^
2 + 4*ArcSin[a*x]^2*(Log[1 - E^(I*ArcSin[a*x])] - Log[1 + E^(I*ArcSin[a*x])
]) + 8*Log[Tan[ArcSin[a*x]/2]] + (8*I)*ArcSin[a*x]*(PolyLog[2, -E^(I*ArcSin
[a*x])] - PolyLog[2, E^(I*ArcSin[a*x])]) + 8*(-PolyLog[3, -E^(I*ArcSin[a*x]
)] + PolyLog[3, E^(I*ArcSin[a*x])]) + ArcSin[a*x]^2*Sec[ArcSin[a*x]/2]^2 -
4*ArcSin[a*x]*Tan[ArcSin[a*x]/2]))/8
```

Maple [A] time = 0.155, size = 269, normalized size = 1.7

$$-\frac{\arcsin(ax)}{(2a^2x^2-2)x^2}\sqrt{-a^2x^2+1}\left(a^2x^2\arcsin(ax) - 2ax\sqrt{-a^2x^2+1} - \arcsin(ax)\right) + ia^2\arcsin(ax)\,\text{polylog}\left(2,-iax-\sqrt{-a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*arcsin(a*x)*(a^2*x^2*arcsin(a*x)-2*
a*x*(-a^2*x^2+1)^(1/2)-arcsin(a*x))+I*a^2*arcsin(a*x)*polylog(2,-I*a*x-(-a^
2*x^2+1)^(1/2))-I*a^2*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-1/2*a
rcsin(a*x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))*a^2+1/2*arcsin(a*x)^2*ln(1-I*a*
x-(-a^2*x^2+1)^(1/2))*a^2-a^2*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+a^2*poly
log(3,I*a*x+(-a^2*x^2+1)^(1/2))-2*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))*a^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{\sqrt{-a^2x^2+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^2}{a^2x^5-x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^5 - x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{asin}^2(ax)}{x^3\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/x**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**2/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\arcsin(ax)^2}{\sqrt{-a^2x^2+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

3.272 $\int \frac{\sin^{-1}(ax)^2}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=42

$$\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0678907, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4643, 4641}

$$\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a*Sqrt[c - a^2*c*x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^2}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.0540907, size = 42, normalized size = 1.

$$\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.039, size = 52, normalized size = 1.2

$$-\frac{(\arcsin(ax))^3}{3\,ca\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -1/3*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c/(a^2*x^2-1)*arcsin(a*x)^
3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)^2}{a^2cx^2-c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^2*c*x^2 - c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{asin}^2(ax)}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**2/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin{(ax)}^2}{\sqrt{-a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/sqrt(-a^2*c*x^2 + c), x)
```

3.273 $\int \frac{\sin^{-1}(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=179

$$-\frac{i\sqrt{1-a^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}+\frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

```
[Out] (x*ArcSin[a*x]^2)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^2)/(a*c*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*Log[1 + E
^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*Pol
yLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.128756, antiderivative size = 179, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4653, 4675, 3719, 2190, 2279, 2391}

$$-\frac{i\sqrt{1-a^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}+\frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^2)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^2)/(a*c*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*Log[1 + E
^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*Pol
yLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2])
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{3/2}}\,dx &= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{\left(2a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)}{1-a^2x^2}\,dx}{c\sqrt{c-a^2cx^2}}\\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{\left(2\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int x\tan(x)\,dx,x,\sin^{-1}(ax)\right)}{ac\sqrt{c-a^2cx^2}}\\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{\left(4i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}x}{1+e^{2ix}}\,dx,x,\sin^{-1}(ax)\right)}{ac\sqrt{c-a^2cx^2}}\\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}-\frac{\left(2\sqrt{1-a^2x^2}\right.}{}\\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}+\frac{\left(i\sqrt{1-a^2x^2}\right.}{}\\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\text{Li}}{ac\sqrt{c}}
\end{aligned}$$

Mathematica [A] time = 0.221492, size = 108, normalized size = 0.6

$$\frac{\sin^{-1}(ax)\left(ax\sin^{-1}(ax)+\sqrt{1-a^2x^2}\left(2\log\left(1+e^{2i\sin^{-1}(ax)}\right)-i\sin^{-1}(ax)\right)\right)-i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c\left(1-a^2x^2\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (ArcSin[a*x]*(a*x*ArcSin[a*x] + Sqrt[1 - a^2*x^2]*((-I)*ArcSin[a*x] + 2*Log
[1 + E^((2*I)*ArcSin[a*x])])) - I*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*Ar
cSin[a*x])])/(a*c*Sqrt[c*(1 - a^2*x^2)])
```

Maple [A] time = 0.102, size = 169, normalized size = 0.9

$$-\frac{(\arcsin(ax))^2}{ac^2\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}\left(i\sqrt{-a^2x^2+1}+ax\right)+\frac{i}{ac^2\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}\sqrt{-c\left(a^2x^2-1\right)}\left(2i\arcsin(ax)\ln\left(1+\left(i\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)+a*x)*arcsin(a*x)^2/c^2/a/(a^2
*x^2-1)+I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)/c^2/a/(a^2*x^2-1)*(2*I*
arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(2,-(
I*a*x+(-a^2*x^2+1)^(1/2))^2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)^2}{a^4c^2x^4-2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 +
c^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^2(ax)}{\left(-c\,(ax-1)\,(ax+1)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(3/2), x)
```

3.274 $\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=283

$$-\frac{2i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}+\frac{x}{3c^2\sqrt{c-a^2cx^2}}+\frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}}-\frac{2i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3ac^2\sqrt{c-a^2cx^2}}-\frac{\sin^{-1}(}{3ac^2\sqrt{1-a^2x^2}}$$

```
[Out] x/(3*c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]/(3*a*c^2*Sqrt[1 - a^2*x^2]*Sqrt
[c - a^2*c*x^2]) + (x*ArcSin[a*x]^2)/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Arc
Sin[a*x]^2)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 - a^2*x^2]*ArcS
in[a*x]^2)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*L
og[1 + E^((2*I)*ArcSin[a*x])])/(3*a*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*S
qrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*
x^2])
```

Rubi [A] time = 0.216651, antiderivative size = 283, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4655, 4653, 4675, 3719, 2190, 2279, 2391, 4677, 191}

$$-\frac{2i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}+\frac{x}{3c^2\sqrt{c-a^2cx^2}}+\frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}}-\frac{2i\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{3ac^2\sqrt{c-a^2cx^2}}-\frac{\sin^{-1}(}{3ac^2\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] x/(3*c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]/(3*a*c^2*Sqrt[1 - a^2*x^2]*Sqrt
[c - a^2*c*x^2]) + (x*ArcSin[a*x]^2)/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Arc
Sin[a*x]^2)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 - a^2*x^2]*ArcS
in[a*x]^2)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*L
og[1 + E^((2*I)*ArcSin[a*x])])/(3*a*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*S
qrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*
x^2])
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{5/2}}\,dx = \frac{x\sin^{-1}(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{3c} - \frac{\left(2a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)}{\left(1-a^2x^2\right)^2}\,dx}{3c^2\sqrt{c-a^2cx^2}}$$

$$= -\frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\int \frac{1}{\left(1-a^2x^2\right)^{3/2}}\,dx}{3c^2\sqrt{c-a^2cx^2}} -$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{\left(4\sqrt{1-a^2x\right.}}{}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x}}{3ac^2\sqrt{c}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x}}{3ac^2\sqrt{c}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x}}{3ac^2\sqrt{c}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x}}{3ac^2\sqrt{c}}$$

Mathematica [A] time = 0.586031, size = 149, normalized size = 0.53

$$\frac{-2i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right) + \left(ax\left(\frac{1}{1-a^2x^2}+2\right) - 2i\sqrt{1-a^2x^2}\right)\sin^{-1}(ax)^2 + \frac{\sin^{-1}(ax)\left(-1+\left(4-4a^2x^2\right)\log\left(1+e^{2i\sin^{-1}}\right.\right.}{\sqrt{1-a^2x^2}}}{3ac^2\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (a*x + ((-2*I)*Sqrt[1 - a^2*x^2] + a*x*(2 + (1 - a^2*x^2)^(-1)))*ArcSin[a*x
]^2 + (ArcSin[a*x]*(-1 + (4 - 4*a^2*x^2)*Log[1 + E^((2*I)*ArcSin[a*x])]))/S
qrt[1 - a^2*x^2] - (2*I)*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x]
)])/(3*a*c^2*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.167, size = 365, normalized size = 1.3

$$-\frac{1}{3c^3\left(3a^6x^6-10a^4x^4+11a^2x^2-4\right)a}\sqrt{-c\left(a^2x^2-1\right)}\left(2i\sqrt{-a^2x^2+1}x^2a^2+2a^3x^3-2i\sqrt{-a^2x^2+1}-3ax\right)\left(-2i\,\text{arc}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/3*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+2*a^3*x^3-2*I*(
-a^2*x^2+1)^(1/2)-3*a*x)*(-2*I*arcsin(a*x)*x^4*a^4-2*arcsin(a*x)*(-a^2*x^2+
1)^(1/2)*x^3*a^3+I*(-a^2*x^2+1)^(1/2)*x^3*a^3-a^4*x^4+3*arcsin(a*x)^2*x^2*a
```

```
^2+4*I*arcsin(a*x)*x^2*a^2+3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x*a-I*(-a^2*x^2
+1)^(1/2)*x*a+3*a^2*x^2-4*arcsin(a*x)^2-2*I*arcsin(a*x)-2)/c^3/(3*a^6*x^6-1
0*a^4*x^4+11*a^2*x^2-4)/a+2/3*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(
2*I*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(
2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/a/c^3/(a^2*x^2-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{(-a^2cx^2+c)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)^2}{a^6c^3x^6-3\,a^4c^3x^4+3\,a^2c^3x^2-c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 +
 3*a^2*c^3*x^2 - c^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^2(ax)}{(-c(ax-1)(ax+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{(-a^2cx^2+c)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(5/2), x)
```

3.275 $\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{7/2}}\,dx$

Optimal. Leaf size=390

$$-\frac{8i\sqrt{1-a^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}}+\frac{x}{3c^3\sqrt{c-a^2cx^2}}+\frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}+\frac{8x\sin^{-1}(ax)^2}{15c^3\sqrt{c-a^2cx^2}}-\frac{8i\sqrt{1-a^2x^2}}{15ac^3\sqrt{c}}$$

```
[Out] x/(3*c^3*Sqrt[c - a^2*c*x^2]) + x/(30*c^3*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]
) - ArcSin[a*x]/(10*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - (4*Arc
Sin[a*x])/(15*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]
^2)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^2)/(15*c^2*(c - a^2*c*x^
2)^(3/2)) + (8*x*ArcSin[a*x]^2)/(15*c^3*Sqrt[c - a^2*c*x^2]) - (((8*I)/15)*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(a*c^3*Sqrt[c - a^2*c*x^2]) + (16*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]*Log[1 + E^((2*I)*ArcSin[a*x])])/(15*a*c^3*Sqrt[c - a^
2*c*x^2]) - (((8*I)/15)*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])
])/(a*c^3*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.328618, antiderivative size = 390, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4655, 4653, 4675, 3719, 2190, 2279, 2391, 4677, 191, 192}

$$-\frac{8i\sqrt{1-a^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}}+\frac{x}{3c^3\sqrt{c-a^2cx^2}}+\frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}+\frac{8x\sin^{-1}(ax)^2}{15c^3\sqrt{c-a^2cx^2}}-\frac{8i\sqrt{1-a^2x^2}}{15ac^3\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(7/2),x]
```


```
[Out] x/(3*c^3*Sqrt[c - a^2*c*x^2]) + x/(30*c^3*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]
) - ArcSin[a*x]/(10*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - (4*Arc
Sin[a*x])/(15*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]
^2)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^2)/(15*c^2*(c - a^2*c*x^
2)^(3/2)) + (8*x*ArcSin[a*x]^2)/(15*c^3*Sqrt[c - a^2*c*x^2]) - (((8*I)/15)*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(a*c^3*Sqrt[c - a^2*c*x^2]) + (16*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]*Log[1 + E^((2*I)*ArcSin[a*x])])/(15*a*c^3*Sqrt[c - a^
2*c*x^2]) - (((8*I)/15)*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])
])/(a*c^3*Sqrt[c - a^2*c*x^2])
```


Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
```

```
- 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{7/2}}\,dx = \frac{x\sin^{-1}(ax)^2}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{5/2}}\,dx}{5c} - \frac{\left(2a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)}{\left(1-a^2x^2\right)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{\sin^{-1}(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4x\sin^{-1}(ax)^2}{15c^2\left(c-a^2cx^2\right)^{3/2}} + \frac{8\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{15c^2} + \cdots$$

$$= \frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \frac{4\sin^{-1}(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

Mathematica [A] time = 0.809866, size = 234, normalized size = 0.6

$$\frac{\sqrt{1-a^2x^2}\left(-16i\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right) + \frac{a^3x^3}{\left(1-a^2x^2\right)^{3/2}} + \frac{11ax}{\sqrt{1-a^2x^2}} + \frac{16ax\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} + \frac{8\sin^{-1}(ax)\left(\frac{ax\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}-1\right)}{1-a^2x^2} + \frac{3\sin^{-1}(ax)\left(\frac{2ax\sin\cdots}{\sqrt{1-\cdots}}\right.}{\left(1-a^2x^2\right)^2}\cdots\right.}{30ac^3\sqrt{c\left(1-a^2x^2\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*((a^3*x^3)/(1 - a^2*x^2)^(3/2) + (11*a*x)/Sqrt[1 - a^2*x
^2] - (16*I)*ArcSin[a*x]^2 + (16*a*x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2] + (8*
ArcSin[a*x]*(-1 + (a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2]))/(1 - a^2*x^2) + (3*
ArcSin[a*x]*(-1 + (2*a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2]))/(1 - a^2*x^2)^2 +
 32*ArcSin[a*x]*Log[1 + E^((2*I)*ArcSin[a*x])] - (16*I)*PolyLog[2, -E^((2*I
)*ArcSin[a*x])]))/(30*a*c^3*Sqrt[c*(1 - a^2*x^2)])
```

Maple [A] time = 0.207, size = 556, normalized size = 1.4

$$-\frac{1}{30\,c^4\left(40\,a^{10}x^{10}-215\,x^8a^8+469\,x^6a^6-517\,a^4x^4+287\,a^2x^2-64\right)a}\sqrt{-c\left(a^2x^2-1\right)}\left(8\,a^5x^5-20\,a^3x^3+8\,i\sqrt{-a^2x^2+1}x\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x)
```

```
[Out] -1/30*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/2)*x
^4*a^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+8*I*(-a^2*x^2+1)^(1/2))*(126*
I*(-a^2*x^2+1)^(1/2)*x^5*a^5+64*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x^7*a^7-32*I
*(-a^2*x^2+1)^(1/2)*x^7*a^7+32*x^8*a^8+456*I*arcsin(a*x)*x^4*a^4-248*arcsin
(a*x)*(-a^2*x^2+1)^(1/2)*x^5*a^5+62*I*(-a^2*x^2+1)^(1/2)*x*a-142*x^6*a^6+80
*a^4*x^4*arcsin(a*x)^2+64*I*arcsin(a*x)*x^8*a^8+340*arcsin(a*x)*(-a^2*x^2+1
)^(1/2)*x^3*a^3-156*I*(-a^2*x^2+1)^(1/2)*x^3*a^3+265*a^4*x^4-190*arcsin(a*x
)^2*x^2*a^2-280*I*arcsin(a*x)*x^6*a^6-165*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x*
a-328*I*arcsin(a*x)*x^2*a^2-235*a^2*x^2+128*arcsin(a*x)^2+88*I*arcsin(a*x)+
80)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+287*a^2*x^2-64)/a
+8/15*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(2*I*arcsin(a*x)*ln(1+(I*
a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(2,-(I*a*x+(-a^2*x^2+1)^(
1/2))^2))/a/c^4/(a^2*x^2-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{\left(-a^2cx^2+c\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(7/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)^2}{a^8c^4x^8-4\,a^6c^4x^6+6\,a^4c^4x^4-4\,a^2c^4x^2+c^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 +
6*a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(7/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^2}{\left(-a^2cx^2+c\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(7/2), x)
```

3.276 $\int x^m \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=1312

result too large to display

```
[Out] (2*b^2*c^2*d^3*x^(3 + m))/((3 + m)*(7 + m)^2) + (30*b^2*c^2*d^3*x^(3 + m))/
((3 + m)^2*(5 + m)*(7 + m)^2) + (36*b^2*c^2*d^3*x^(3 + m))/((3 + m)^2*(5 +
m)^2*(7 + m)) + (12*b^2*c^2*d^3*x^(3 + m))/((3 + m)*(5 + m)^2*(7 + m)) + (4
8*b^2*c^2*d^3*x^(3 + m))/((3 + m)^3*(5 + m)*(7 + m)) + (10*b^2*c^2*d^3*x^(3
 + m))/((7 + m)^2*(15 + 8*m + m^2)) - (10*b^2*c^4*d^3*x^(5 + m))/((5 + m)^2
*(7 + m)^2) - (4*b^2*c^4*d^3*x^(5 + m))/((5 + m)*(7 + m)^2) - (12*b^2*c^4*d
^3*x^(5 + m))/((5 + m)^3*(7 + m)) + (2*b^2*c^6*d^3*x^(7 + m))/(7 + m)^3 - (
36*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((3 + m)*(5 + m
)^2*(7 + m)) - (48*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/((3 + m)^2*(5 + m)*(7 + m)) - (30*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x]))/((7 + m)^2*(15 + 8*m + m^2)) - (10*b*c*d^3*x^(2 + m)*(1 -
c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((5 + m)*(7 + m)^2) - (12*b*c*d^3*x^(2
+ m)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((5 + m)^2*(7 + m)) - (2*b*c*
d^3*x^(2 + m)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(7 + m)^2 + (48*d^3*
x^(1 + m)*(a + b*ArcSin[c*x])^2)/((5 + m)*(7 + m)*(3 + 4*m + m^2)) + (24*d^
3*x^(1 + m)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((7 + m)*(15 + 8*m + m^2))
 + (6*d^3*x^(1 + m)*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/((5 + m)*(7 + m)
) + (d^3*x^(1 + m)*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(7 + m) - (48*b*c
*d^3*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m
)/2, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)*(7 + m)) - (30*b*c*d^3*x^(2 + m)*
(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/
((5 + m)*(7 + m)^2*(6 + 5*m + m^2)) - (36*b*c*d^3*x^(2 + m)*(a + b*ArcSin[c
*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((5 + m)^2*(7 +
 m)*(6 + 5*m + m^2)) - (96*b*c*d^3*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeome
tric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((5 + m)*(7 + m)*(6 + 11*m + 6
*m^2 + m^3)) + (30*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3
/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)*(7 +
m)^2) + (36*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/
2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)^2*(7 + m)) +
 (48*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2
+ m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3*(5 + m)*(7 + m)) + (96*b^2*
c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/
2 + m/2}, c^2*x^2])/((3 + m)^2*(5 + m)*(7 + m)*(2 + 3*m + m^2))
```

Rubi [F] time = 0.0826601, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x^m \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int x^m (d - c^2dx^2)^3 (a + b\sin^{-1}(cx))^2 \, dx = \int x^m (d - c^2dx^2)^3 (a + b\sin^{-1}(cx))^2 \, dx$$

Mathematica [F] time = 3.46781, size = 0, normalized size = 0.

$$\int x^m (d - c^2dx^2)^3 (a + b\sin^{-1}(cx))^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2, x]
```

Maple [F] time = 14.642, size = 0, normalized size = 0.

$$\int x^m \left(-c^2dx^2 + d\right)^3 (a + b\arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

integral $\left(-\left(a^2c^6d^3x^6 - 3\,a^2c^4d^3x^4 + 3\,a^2c^2d^3x^2 - a^2d^3 + \left(b^2c^6d^3x^6 - 3\,b^2c^4d^3x^4 + 3\,b^2c^2d^3x^2 - b^2d^3\right)\arcsin(cx)^2 + 2\,(ab\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\left(c^2dx^2 - d\right)^3 (b\arcsin\left(cx\right) + a)^2 x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2*x^m, x)
```

3.277 $\int x^m \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=756

$$\frac{16b^2c^2d^2x^{m+3}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2}\right\},\left\{\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2}\right\},c^2x^2\right)}{(m+3)^2(m+5)\left(m^2+3m+2\right)}+\frac{8b^2c^2d^2x^{m+3}\text{HypergeometricPFQ}}{(m+2)(}$$

```
[Out] (6*b^2*c^2*d^2*x^(3 + m))/((3 + m)^2*(5 + m)^2) + (2*b^2*c^2*d^2*x^(3 + m))
/((3 + m)*(5 + m)^2) + (8*b^2*c^2*d^2*x^(3 + m))/((3 + m)^3*(5 + m)) - (2*b
^2*c^4*d^2*x^(5 + m))/(5 + m)^3 - (6*b*c*d^2*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/((3 + m)*(5 + m)^2) - (8*b*c*d^2*x^(2 + m)*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/((3 + m)^2*(5 + m)) - (2*b*c*d^2*x^(2 + m)*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(5 + m)^2 + (8*d^2*x^(1 + m)*(a + b*ArcS
in[c*x])^2)/((5 + m)*(3 + 4*m + m^2)) + (4*d^2*x^(1 + m)*(1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/(15 + 8*m + m^2) + (d^2*x^(1 + m)*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/(5 + m) - (8*b*c*d^2*x^(2 + m)*(a + b*ArcSin[c*x])*Hyperge
ometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m))
 - (6*b*c*d^2*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/
2, (4 + m)/2, c^2*x^2])/((5 + m)^2*(6 + 5*m + m^2)) - (16*b*c*d^2*x^(2 + m)
*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])
/((5 + m)*(6 + 11*m + 6*m^2 + m^3)) + (6*b^2*c^2*d^2*x^(3 + m)*Hypergeometr
icPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(
3 + m)^2*(5 + m)^2) + (8*b^2*c^2*d^2*x^(3 + m)*HypergeometricPFQ[{1, 3/2 +
m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3*(5 + m)
) + (16*b^2*c^2*d^2*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2},
{2 + m/2, 5/2 + m/2}, c^2*x^2])/((3 + m)^2*(5 + m)*(2 + 3*m + m^2))
```

Rubi [F] time = 0.0806745, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x^m \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx = \int x^m \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Mathematica [F] time = 0.142369, size = 0, normalized size = 0.

$$\int x^m \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2, x]
```

Maple [F] time = 7.016, size = 0, normalized size = 0.

$$\int x^m \left(-c^2 d x^2+d\right)^2 (a+b \arcsin (c x))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$\text{integral}\left(\left(a^2c^4d^2x^4 - 2\,a^2c^2d^2x^2 + a^2d^2 + \left(b^2c^4d^2x^4 - 2\,b^2c^2d^2x^2 + b^2d^2\right)\arcsin(cx)^2 + 2\left(abc^4d^2x^4 - 2\,abc^2d^2x^2 + a\right.\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(c^2 d x^2 - d\right)^2 (b \arcsin (c x) + a)^2 x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2*x^m, x)
```

3.278 $\int x^m \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=371

$$\frac{4b^2c^2dx^{m+3}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2}\right\},\left\{\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2}\right\},c^2x^2\right)}{(m+3)^2\left(m^2+3m+2\right)}+\frac{2b^2c^2dx^{m+3}\text{HypergeometricPFQ}}{(m+}$$

```
[Out] (2*b^2*c^2*d*x^(3 + m))/(3 + m)^3 - (2*b*c*d*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(3 + m)^2 + (2*d*x^(1 + m)*(a + b*ArcSin[c*x])^2)/(3 + 4
*m + m^2) + (d*x^(1 + m)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3 + m) - (2*
b*c*d*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 +
m)/2, c^2*x^2])/((2 + m)*(3 + m)^2) - (4*b*c*d*x^(2 + m)*(a + b*ArcSin[c*x]
)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(6 + 11*m + 6*m^2
+ m^3) + (2*b^2*c^2*d*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}
, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3) + (4*b^2*c^2*d*x^(3 +
 m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*
x^2])/((3 + m)^2*(2 + 3*m + m^2))
```

Rubi [F] time = 0.0489392, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x^m \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx=\int x^m \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Mathematica [F] time = 0.0924532, size = 0, normalized size = 0.

$$\int x^m \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [F] time = 2.915, size = 0, normalized size = 0.

$$\int x^m \left(-c^2dx^2+d\right)\left(a+b\arcsin(cx)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(a^2c^2dx^2 - a^2d + \left(b^2c^2dx^2 - b^2d\right)\arcsin(cx)^2 + 2\left(abc^2dx^2 - abd\right)\arcsin(cx)\right)x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*x^m, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int -a^2x^m\,dx + \int -b^2x^m \operatorname{asin}^2(cx)\,dx + \int -2abx^m \operatorname{asin}(cx)\,dx + \int a^2c^2x^2x^m\,dx + \int b^2c^2x^2x^m \operatorname{asin}^2(cx)\,dx + \int 2a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] -d*(Integral(-a**2*x**m, x) + Integral(-b**2*x**m*asin(c*x)**2, x) + Integr
al(-2*a*b*x**m*asin(c*x), x) + Integral(a**2*c**2*x**2*x**m, x) + Integral(
b**2*c**2*x**2*x**m*asin(c*x)**2, x) + Integral(2*a*b*c**2*x**2*x**m*asin(c
*x), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\left(c^2dx^2 - d\right)(b\arcsin(cx) + a)^2x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2*x^m, x)
```

3.279 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=29

$$\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2},x\right)$$

```
[Out] Unintegrable[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x]
```

Rubi [A] time = 0.0906326, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x]
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx=\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$$

Mathematica [A] time = 6.46626, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x]
```

Maple [A] time = 0.463, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\arcsin(cx)\right)^2}{-c^2dx^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{(b\arcsin(cx)+a)^2 x^m}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)x^m}{c^2dx^2-d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^2*d*x^2 - d)
, x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{a^2x^m}{c^2x^2-1}\,dx+\int \frac{b^2x^m\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx+\int \frac{2abx^m\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**m/(c**2*x**2 - 1), x) + Integral(b**2*x**m*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**m*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b\arcsin(cx)+a)^2 x^m}{c^2dx^2-d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d), x)
```

3.280 $\int \frac{x^m(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=279

$$-\frac{b^2c^2(m+1)x^{m+3}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2}\right\},\left\{\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2}\right\},c^2x^2\right)}{d^2\left(m^2+5m+6\right)}+\frac{bc(m+1)x^{m+2}\text{Hypergeome}}{}$$

```
[Out] -((b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (x^(1 + m)
*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2)) + (b*c*(1 + m)*x^(2 + m)*(a +
 b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d^2
*(2 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c
^2*x^2])/(d^2*(3 + m)) - (b^2*c^2*(1 + m)*x^(3 + m)*HypergeometricPFQ[{1, 3
/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(d^2*(6 + 5*m + m^2))
 + ((1 - m)*Unintegrable[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x])/(
2*d)
```

Rubi [A] time = 0.408235, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (x^(1 + m)
*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2)) + (b*c*(1 + m)*x^(2 + m)*(a +
 b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d^2
*(2 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c
^2*x^2])/(d^2*(3 + m)) - (b^2*c^2*(1 + m)*x^(3 + m)*HypergeometricPFQ[{1, 3
/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(d^2*(6 + 5*m + m^2))
 + ((1 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x])/(2*
d)
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx=\frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)}-\frac{(bc)\int \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2}+\frac{(1-m)\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx}{2d}$$

$$=-\frac{bcx^{2+m}\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)}+\frac{\left(b^2c^2\right)\int \frac{x^{2+m}}{1-c^2x^2}\,dx}{d^2}+\frac{(1-m)\int}{}$$

$$=-\frac{bcx^{2+m}\left(a+b\sin^{-1}(cx)\right)}{d^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)}+\frac{bc(1+m)x^{2+m}\left(a+b\sin^{-1}(cx)\right)}{d^2(2+m}$$

Mathematica [A] time = 7.95983, size = 0, normalized size = 0.

$$\int \frac{x^m \left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2, x]
```

Maple [A] time = 0.526, size = 0, normalized size = 0.

$$\int \frac{x^m \left(a+b\arcsin\left(cx\right)\right)^2}{\left(-c^2dx^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2 x^m}{\left(c^2dx^2-d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2\right)x^m}{c^4d^2x^4-2\,c^2d^2x^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^4*d^2*x^4 - 2
*c^2*d^2*x^2 + d^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{a^2x^m}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^m\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^m\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**m/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**m*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**m*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2x^m}{\left(c^2dx^2-d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^2, x)
```

3.281 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=668

$$-\frac{b^2c^2(1-m)(m+1)x^{m+3}\text{HypergeometricPFQ}\left(\left\{1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2}\right\},\left\{\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2}\right\},c^2x^2\right)}{6d^3\left(m^2+5m+6\right)}-\frac{b^2c^2(3-m)(m+1)x^{m+3}\text{H}}{}$$

```
[Out] -(b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2)) - (b*c*(1
- m)*x^(2 + m)*(a + b*ArcSin[c*x]))/(6*d^3*Sqrt[1 - c^2*x^2]) - (b*c*(3 - m
)*x^(2 + m)*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) + (x^(1 + m)*(a
+ b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m)*(a + b*Arc
Sin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) + (b*c*(1 - m)*(1 + m)*x^(2 + m)*(a + b*
ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(6*d^3*
(2 + m)) + (b*c*(3 - m)*(1 + m)*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometri
c2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 + m)) + (b^2*c^2*(1 - m
)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(3
+ m)) + (b^2*c^2*(3 - m)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/
2, c^2*x^2])/(4*d^3*(3 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[2, (3 +
 m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(3 + m)) - (b^2*c^2*(1 - m)*(1 + m)*x^(3
 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^
2*x^2])/(6*d^3*(6 + 5*m + m^2)) - (b^2*c^2*(3 - m)*(1 + m)*x^(3 + m)*Hyperg
eometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(4*d
^3*(6 + 5*m + m^2)) + ((1 - m)*(3 - m)*Unintegrable[(x^m*(a + b*ArcSin[c*x]
)^2)/(d - c^2*d*x^2), x])/(8*d^2)
```

Rubi [A] time = 0.91303, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] -(b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2)) - (b*c*(1
- m)*x^(2 + m)*(a + b*ArcSin[c*x]))/(6*d^3*Sqrt[1 - c^2*x^2]) - (b*c*(3 - m
)*x^(2 + m)*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) + (x^(1 + m)*(a
+ b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m)*(a + b*Arc
Sin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) + (b*c*(1 - m)*(1 + m)*x^(2 + m)*(a + b*
ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(6*d^3*
(2 + m)) + (b*c*(3 - m)*(1 + m)*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometri
c2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 + m)) + (b^2*c^2*(1 - m
)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(3
+ m)) + (b^2*c^2*(3 - m)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/
2, c^2*x^2])/(4*d^3*(3 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[2, (3 +
 m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(3 + m)) - (b^2*c^2*(1 - m)*(1 + m)*x^(3
 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^
2*x^2])/(6*d^3*(6 + 5*m + m^2)) - (b^2*c^2*(3 - m)*(1 + m)*x^(3 + m)*Hyperg
eometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(4*d
^3*(6 + 5*m + m^2)) + ((1 - m)*(3 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x])^
```

```
2)/(d - c^2*d*x^2), x])/(8*d^2)
```

Rubi steps

$$\int \frac{x^m \left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2d^3} + \frac{(3-m)\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx}{4d}$$

$$= -\frac{bcx^{2+m}\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} + \frac{x^{1+m}\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{(3-m)x^{1+m}\left(a+b\sin^{-1}(cx)\right)^2}{8d^3\left(1-c^2x^2\right)}$$

$$= -\frac{bcx^{2+m}\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{bc(1-m)x^{2+m}\left(a+b\sin^{-1}(cx)\right)}{6d^3\sqrt{1-c^2x^2}} - \frac{bc(3-m)x^{2+m}\left(a+b\,\mathrm{si}\right.}{4d^3\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^{2+m}\left(a+b\sin^{-1}(cx)\right)}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{bc(1-m)x^{2+m}\left(a+b\sin^{-1}(cx)\right)}{6d^3\sqrt{1-c^2x^2}} - \frac{bc(3-m)x^{2+m}\left(a+b\,\mathrm{si}\right.}{4d^3\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 9.12492, size = 0, normalized size = 0.

$$\int \frac{x^m \left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]

[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3, x]
```

Maple [A] time = 0.605, size = 0, normalized size = 0.

$$\int \frac{x^m \left(a+b\arcsin(cx)\right)^2}{\left(-c^2dx^2+d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)

[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{\left(b\arcsin(cx)+a\right)^2 x^m}{\left(c^2dx^2-d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^3, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2 \arcsin(cx)^2 + 2\,ab \arcsin(cx) + a^2\right)x^m}{c^6d^3x^6 - 3\,c^4d^3x^4 + 3\,c^2d^3x^2 - d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^6*d^3*x^6 -
3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{(b \arcsin(cx) + a)^2 x^m}{\left(c^2dx^2 - d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^3, x)
```

3.282 $\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 dx$

Optimal. Leaf size=957

$$\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2 x^{m+1}}{m+6}+\frac{5d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 x^{m+1}}{(m+4)(m+6)}+\frac{15d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{(m+6)\left(m^2+6m+8\right)}$$

```
[Out] (10*b^2*c^2*d^2*x^(3 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^3*(6 + m)) + (2*b^2
*c^2*d^2*(52 + 15*m + m^2)*x^(3 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^2*(6 + m
)^3) - (2*b^2*c^4*d^2*x^(5 + m)*Sqrt[d - c^2*d*x^2])/(6 + m)^3 - (30*b*c*d^
2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*(4 + m)*(6
+ m)*Sqrt[1 - c^2*x^2]) - (10*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x]))/((6 + m)*(8 + 6*m + m^2)*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*x^(2
 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((12 + 8*m + m^2)*Sqrt[1 - c
^2*x^2]) + (10*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/((4 + m)^2*(6 + m)*Sqrt[1 - c^2*x^2]) + (4*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x]))/((4 + m)*(6 + m)*Sqrt[1 - c^2*x^2]) - (2*b*c^
5*d^2*x^(6 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((6 + m)^2*Sqrt[1
- c^2*x^2]) + (15*d^2*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/
((6 + m)*(8 + 6*m + m^2)) + (5*d*x^(1 + m)*(d - c^2*d*x^2)^(3/2)*(a + b*Arc
Sin[c*x])^2)/((4 + m)*(6 + m)) + (x^(1 + m)*(d - c^2*d*x^2)^(5/2)*(a + b*Ar
cSin[c*x])^2)/(6 + m) + (30*b^2*c^2*d^2*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hyper
geometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(3 + m)*(4 + m
)*(6 + m)*Sqrt[1 - c^2*x^2]) + (10*b^2*c^2*d^2*(10 + 3*m)*x^(3 + m)*Sqrt[d
- c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m
)*(3 + m)*(4 + m)^3*(6 + m)*Sqrt[1 - c^2*x^2]) + (2*b^2*c^2*d^2*(264 + 130*
m + 15*m^2)*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2,
 (5 + m)/2, c^2*x^2])/((2 + m)*(3 + m)*(4 + m)^2*(6 + m)^3*Sqrt[1 - c^2*x^2
]) + (15*d^3*Unintegrable[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],
x])/((6 + m)*(8 + 6*m + m^2))
```

Rubi [A] time = 0.157333, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 dx = \int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 dx$$

Mathematica [A] time = 4.44079, size = 0, normalized size = 0.

$$\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 7.355, size = 0, normalized size = 0.

$$\int x^m \left(-c^2 d x^2 + d\right)^{\frac{5}{2}} (a + b \arcsin(cx))^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2 d x^2 + d\right)^{\frac{5}{2}} (b \arcsin(cx) + a)^2 x^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(a^2 c^4 d^2 x^4 - 2\, a^2 c^2 d^2 x^2 + a^2 d^2 + \left(b^2 c^4 d^2 x^4 - 2\, b^2 c^2 d^2 x^2 + b^2 d^2\right) \arcsin(cx)^2 + 2\left(abc^4 d^2 x^4 - 2\, abc^2 d^2 x^2 + abd^2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{5}{2}} (b \arcsin (cx) + a)^2 x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

3.283 $\int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=499

$$\frac{3d^2\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}},x\right)}{m^2+6m+8}+\frac{2b^2c^2d(3m+10)x^{m+3}\sqrt{d-c^2dx^2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+3}{2},\frac{m+5}{2},c^2x^2\right)}{(m+2)(m+3)(m+4)^3\sqrt{1-c^2x^2}}+\cdots$$

```
[Out] (2*b^2*c^2*d*x^(3 + m)*Sqrt[d - c^2*d*x^2])/(4 + m)^3 - (6*b*c*d*x^(2 + m)*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*(4 + m)*Sqrt[1 - c^2*x^
2]) - (2*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((8 + 6*m
 + m^2)*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^(4 + m)*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x]))/((4 + m)^2*Sqrt[1 - c^2*x^2]) + (3*d*x^(1 + m)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^2)/(8 + 6*m + m^2) + (x^(1 + m)*(d - c^2*d*x^2)
^(3/2)*(a + b*ArcSin[c*x])^2)/(4 + m) + (6*b^2*c^2*d*x^(3 + m)*Sqrt[d - c^2
*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(
3 + m)*(4 + m)*Sqrt[1 - c^2*x^2]) + (2*b^2*c^2*d*(10 + 3*m)*x^(3 + m)*Sqrt[
d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 +
 m)*(3 + m)*(4 + m)^3*Sqrt[1 - c^2*x^2]) + (3*d^2*Unintegrable[(x^m*(a + b*
ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x])/(8 + 6*m + m^2)
```

Rubi [A] time = 0.152028, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx=\int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Mathematica [A] time = 0.153677, size = 0, normalized size = 0.

$$\int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 3.022, size = 0, normalized size = 0.

$$\int x^{m} \left(-c^{2} d x^{2}+d\right)^{\frac{3}{2}} \left(a+b \arcsin \left(c x\right)\right)^{2} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^{2} d x^{2}+d\right)^{\frac{3}{2}} \left(b \arcsin \left(c x\right)+a\right)^{2} x^{m}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\left(a^{2} c^{2} d x^{2}-a^{2} d+\left(b^{2} c^{2} d x^{2}-b^{2} d\right) \arcsin \left(c x\right)^{2}+2 \left(a b c^{2} d x^{2}-a b d\right) \arcsin \left(c x\right)\right) \sqrt{-c^{2} d x^{2}+d} x^{m}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^{2} d x^{2}+d\right)^{\frac{3}{2}} \left(b \arcsin \left(c x\right)+a\right)^{2} x^{m}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

3.284 $\int x^m \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=203

$$\frac{d\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}},x\right)}{m+2}+\frac{2b^2c^2x^{m+3}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+3}{2},\frac{m+5}{2},c^2x^2\right)}{(m+2)^2(m+3)\sqrt{1-c^2x^2}}+\frac{x^{m+1}\sqrt{d-c}}{}$$

```
[Out] (-2*b*c*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*Sqrt[
1 - c^2*x^2]) + (x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2 +
m) + (2*b^2*c^2*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m
)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(3 + m)*Sqrt[1 - c^2*x^2]) + (d*Uninte
grable[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x])/(2 + m)
```

Rubi [A] time = 0.138672, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x^m \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int x^m \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\int x^m \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Mathematica [A] time = 0.1013, size = 0, normalized size = 0.

$$\int x^m \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 1.239, size = 0, normalized size = 0.

$$\int x^m\sqrt{-c^2dx^2+d}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*x^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^m, x)
```

3.285 $\int \frac{x^m(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] Unintegrable[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
```

Rubi [A] time = 0.150755, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$$

Mathematica [A] time = 3.13121, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
```

Maple [A] time = 0.637, size = 0, normalized size = 0.

$$\int x^m\left(a+b\arcsin(cx)\right)^2\frac{1}{\sqrt{-c^2dx^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^m}{\sqrt{-c^2 dx^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{\sqrt{-c^2 dx^2 + d}\left(b^2 \arcsin(cx)^2 + 2\, ab \arcsin(cx) + a^2\right)x^m}{c^2 dx^2 - d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \left(a + b \operatorname{asin}(cx)\right)^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x^m}{\sqrt{-c^2 dx^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/sqrt(-c^2*d*x^2 + d), x)
```

3.286 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}},x\right)$$

```
[Out] Unintegrable[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2), x]
```

Rubi [A] time = 0.165947, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 4.27016, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2), x]
```

Maple [A] time = 0.595, size = 0, normalized size = 0.

$$\int x^m\left(a+b\arcsin(cx)\right)^2\left(-c^2dx^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2 x^m}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2 + d}\left(b^2\arcsin(cx)^2 + 2\,ab\arcsin(cx) + a^2\right)x^m}{c^4d^2x^4 - 2\,c^2d^2x^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*x^m/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m\,(a + b\,\mathrm{asin}(cx))^2}{(-d\,(cx - 1)\,(cx + 1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2 x^m}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

3.287 $\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}},x\right)$$

```
[Out] Unintegrable[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2), x]
```

Rubi [A] time = 0.166003, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 4.31902, size = 0, normalized size = 0.

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2), x]
```

Maple [A] time = 0.622, size = 0, normalized size = 0.

$$\int x^m\left(a+b\arcsin(cx)\right)^2\left(-c^2dx^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2x^m}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2dx^2+d}\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)x^m}{c^6d^3x^6-3\,c^4d^3x^4+3\,c^2d^3x^2-d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)*x^m/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2x^m}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

3.288 $\int \frac{x^m \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{x^m \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}, x\right)$$

```
[Out] Unintegrable[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2], x]
```

Rubi [A] time = 0.0953553, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Defer[Int][(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\int \frac{x^m \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx = \int \frac{x^m \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx$$

Mathematica [A] time = 0.862275, size = 0, normalized size = 0.

$$\int \frac{x^m \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Integrate[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2], x]
```

Maple [A] time = 0.497, size = 0, normalized size = 0.

$$\int x^m (\arcsin(ax))^2 \frac{1}{\sqrt{-a^2x^2+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{-a^2x^2+1}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^m \arcsin(ax)^2}{a^2x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^2/(a^2*x^2 - 1), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \operatorname{asin}^2(ax)}{\sqrt{-(ax-1)(ax+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)**2/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{-a^2x^2+1}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

3.289 $\int \left(c-a^2cx^2\right)^3 \sin^{-1}(ax)^3\,dx$

Optimal. Leaf size=370

$$-\frac{6c^3\left(1-a^2x^2\right)^{7/2}}{2401a}-\frac{2664c^3\left(1-a^2x^2\right)^{5/2}}{214375a}-\frac{30256c^3\left(1-a^2x^2\right)^{3/2}}{385875a}-\frac{413312c^3\sqrt{1-a^2x^2}}{128625a}+\frac{6}{343}a^6c^3x^7\sin^{-1}(ax)-\frac{702a^4}{}$$

```
[Out] (-413312*c^3*Sqrt[1 - a^2*x^2])/(128625*a) - (30256*c^3*(1 - a^2*x^2)^(3/2)
)/(385875*a) - (2664*c^3*(1 - a^2*x^2)^(5/2))/(214375*a) - (6*c^3*(1 - a^2*
x^2)^(7/2))/(2401*a) - (4322*c^3*x*ArcSin[a*x])/1225 + (1514*a^2*c^3*x^3*Ar
cSin[a*x])/3675 - (702*a^4*c^3*x^5*ArcSin[a*x])/6125 + (6*a^6*c^3*x^7*ArcSi
n[a*x])/343 + (48*c^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(35*a) + (8*c^3*(1 -
 a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(35*a) + (18*c^3*(1 - a^2*x^2)^(5/2)*ArcSin[
a*x]^2)/(175*a) + (3*c^3*(1 - a^2*x^2)^(7/2)*ArcSin[a*x]^2)/(49*a) + (16*c^
3*x*ArcSin[a*x]^3)/35 + (8*c^3*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/35 + (6*c^3*x
*(1 - a^2*x^2)^2*ArcSin[a*x]^3)/35 + (c^3*x*(1 - a^2*x^2)^3*ArcSin[a*x]^3)/
7
```

Rubi [A] time = 0.699905, antiderivative size = 370, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 13, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.65, Rules used = {4649, 4619, 4677, 261, 4645, 444, 43, 194, 12, 1247, 698, 1799, 1850}

$$-\frac{6c^3\left(1-a^2x^2\right)^{7/2}}{2401a}-\frac{2664c^3\left(1-a^2x^2\right)^{5/2}}{214375a}-\frac{30256c^3\left(1-a^2x^2\right)^{3/2}}{385875a}-\frac{413312c^3\sqrt{1-a^2x^2}}{128625a}+\frac{6}{343}a^6c^3x^7\sin^{-1}(ax)-\frac{702a^4}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^3*ArcSin[a*x]^3,x]
```


```
[Out] (-413312*c^3*Sqrt[1 - a^2*x^2])/(128625*a) - (30256*c^3*(1 - a^2*x^2)^(3/2)
)/(385875*a) - (2664*c^3*(1 - a^2*x^2)^(5/2))/(214375*a) - (6*c^3*(1 - a^2*
x^2)^(7/2))/(2401*a) - (4322*c^3*x*ArcSin[a*x])/1225 + (1514*a^2*c^3*x^3*Ar
cSin[a*x])/3675 - (702*a^4*c^3*x^5*ArcSin[a*x])/6125 + (6*a^6*c^3*x^7*ArcSi
n[a*x])/343 + (48*c^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(35*a) + (8*c^3*(1 -
 a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(35*a) + (18*c^3*(1 - a^2*x^2)^(5/2)*ArcSin[
a*x]^2)/(175*a) + (3*c^3*(1 - a^2*x^2)^(7/2)*ArcSin[a*x]^2)/(49*a) + (16*c^
3*x*ArcSin[a*x]^3)/35 + (8*c^3*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/35 + (6*c^3*x
*(1 - a^2*x^2)^2*ArcSin[a*x]^3)/35 + (c^3*x*(1 - a^2*x^2)^3*ArcSin[a*x]^3)/
7
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1850

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^3 \sin^{-1}(ax)^3\,dx = \frac{1}{7}c^3x\left(1-a^2x^2\right)^3 \sin^{-1}(ax)^3 + \frac{1}{7}(6c)\int \left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^3\,dx - \frac{1}{7}\left(3ac^3\right)\int x\left(1-a^2x$$

$$= \frac{3c^3\left(1-a^2x^2\right)^{7/2}\sin^{-1}(ax)^2}{49a} + \frac{6}{35}c^3x\left(1-a^2x^2\right)^2\sin^{-1}(ax)^3 + \frac{1}{7}c^3x\left(1-a^2x^2\right)^3\sin^{-1}(ax)^3$$

$$= -\frac{6}{49}c^3x\sin^{-1}(ax) + \frac{6}{49}a^2c^3x^3\sin^{-1}(ax) - \frac{18}{245}a^4c^3x^5\sin^{-1}(ax) + \frac{6}{343}a^6c^3x^7\sin^{-1}(ax) +$$

$$= -\frac{402c^3x\sin^{-1}(ax)}{1225} + \frac{318a^2c^3x^3\sin^{-1}(ax)}{1225} - \frac{702a^4c^3x^5\sin^{-1}(ax)}{6125} + \frac{6}{343}a^6c^3x^7\sin^{-1}(ax)$$

$$= -\frac{962c^3x\sin^{-1}(ax)}{1225} + \frac{1514a^2c^3x^3\sin^{-1}(ax)}{3675} - \frac{702a^4c^3x^5\sin^{-1}(ax)}{6125} + \frac{6}{343}a^6c^3x^7\sin^{-1}(ax$$

$$= -\frac{4322c^3x\sin^{-1}(ax)}{1225} + \frac{1514a^2c^3x^3\sin^{-1}(ax)}{3675} - \frac{702a^4c^3x^5\sin^{-1}(ax)}{6125} + \frac{6}{343}a^6c^3x^7\sin^{-1}(a$$

$$= -\frac{960c^3\sqrt{1-a^2x^2}}{343a} - \frac{16c^3\left(1-a^2x^2\right)^{3/2}}{1715a} - \frac{36c^3\left(1-a^2x^2\right)^{5/2}}{8575a} - \frac{6c^3\left(1-a^2x^2\right)^{7/2}}{2401a} - \frac{4322c^3}{1}$$

$$= -\frac{413312c^3\sqrt{1-a^2x^2}}{128625a} - \frac{30256c^3\left(1-a^2x^2\right)^{3/2}}{385875a} - \frac{2664c^3\left(1-a^2x^2\right)^{5/2}}{214375a} - \frac{6c^3\left(1-a^2x^2\right)^{7/2}}{2401a}$$

Mathematica [A] time = 0.322504, size = 171, normalized size = 0.46

$$c^3\left(2\sqrt{1-a^2x^2}\left(16875a^6x^6-134541a^4x^4+747937a^2x^2-22329151\right)-385875ax\left(5a^6x^6-21a^4x^4+35a^2x^2-35\right)\sin^{-1}(\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^3*ArcSin[a*x]^3,x]
```

```
[Out] (c^3*(2*Sqrt[1 - a^2*x^2]*(-22329151 + 747937*a^2*x^2 - 134541*a^4*x^4 + 16
875*a^6*x^6) + 210*a*x*(-226905 + 26495*a^2*x^2 - 7371*a^4*x^4 + 1125*a^6*x
^6)*ArcSin[a*x] - 11025*Sqrt[1 - a^2*x^2]*(-2161 + 757*a^2*x^2 - 351*a^4*x^
4 + 75*a^6*x^6)*ArcSin[a*x]^2 - 385875*a*x*(-35 + 35*a^2*x^2 - 21*a^4*x^4 +
 5*a^6*x^6)*ArcSin[a*x]^3))/(13505625*a)
```

Maple [A] time = 0.078, size = 278, normalized size = 0.8

$$-\frac{c^3}{13505625\,a}\left(1929375\,(\arcsin(ax))^3a^7x^7+826875\,(\arcsin(ax))^2\sqrt{-a^2x^2+1}a^6x^6-8103375\,(\arcsin(ax))^3a^5x^5-23\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x)
```

```
[Out] -1/13505625/a*c^3*(1929375*arcsin(a*x)^3*a^7*x^7+826875*arcsin(a*x)^2*(-a^2
*x^2+1)^(1/2)*a^6*x^6-8103375*arcsin(a*x)^3*a^5*x^5-236250*arcsin(a*x)*a^7*
x^7-3869775*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^4*x^4-33750*a^6*x^6*(-a^2*x^
2+1)^(1/2)+13505625*arcsin(a*x)^3*a^3*x^3+1547910*a^5*x^5*arcsin(a*x)+83459
25*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x^2+269082*a^4*x^4*(-a^2*x^2+1)^(1/
2)-13505625*a*x*arcsin(a*x)^3-5563950*a^3*x^3*arcsin(a*x)-23825025*arcsin(a
*x)^2*(-a^2*x^2+1)^(1/2)-1495874*a^2*x^2*(-a^2*x^2+1)^(1/2)+47650050*a*x*ar
csin(a*x)+44658302*(-a^2*x^2+1)^(1/2))
```

Maxima [A] time = 1.56688, size = 383, normalized size = 1.04

$$-\frac{1}{1225}\left(75\sqrt{-a^2x^2+1}a^4c^3x^6 - 351\sqrt{-a^2x^2+1}a^2c^3x^4 + 757\sqrt{-a^2x^2+1}c^3x^2 - \frac{2161\sqrt{-a^2x^2+1}c^3}{a^2}\right)a\arcsin(ax)^2 - \ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/1225*(75*sqrt(-a^2*x^2 + 1)*a^4*c^3*x^6 - 351*sqrt(-a^2*x^2 + 1)*a^2*c^3
*x^4 + 757*sqrt(-a^2*x^2 + 1)*c^3*x^2 - 2161*sqrt(-a^2*x^2 + 1)*c^3/a^2)*a*
arcsin(a*x)^2 - 1/35*(5*a^6*c^3*x^7 - 21*a^4*c^3*x^5 + 35*a^2*c^3*x^3 - 35*
c^3*x)*arcsin(a*x)^3 + 2/13505625*(16875*sqrt(-a^2*x^2 + 1)*a^4*c^3*x^6 - 1
34541*sqrt(-a^2*x^2 + 1)*a^2*c^3*x^4 + 747937*sqrt(-a^2*x^2 + 1)*c^3*x^2 -
22329151*sqrt(-a^2*x^2 + 1)*c^3/a^2 + 105*(1125*a^6*c^3*x^7 - 7371*a^4*c^3*
x^5 + 26495*a^2*c^3*x^3 - 226905*c^3*x)*arcsin(a*x)/a)*a
```

Fricas [A] time = 1.79716, size = 512, normalized size = 1.38

$$-\frac{385875\left(5a^7c^3x^7 - 21a^5c^3x^5 + 35a^3c^3x^3 - 35ac^3x\right)\arcsin(ax)^3 - 210\left(1125a^7c^3x^7 - 7371a^5c^3x^5 + 26495a^3c^3x^3 - \ldots\right.}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/13505625*(385875*(5*a^7*c^3*x^7 - 21*a^5*c^3*x^5 + 35*a^3*c^3*x^3 - 35*a
*c^3*x)*arcsin(a*x)^3 - 210*(1125*a^7*c^3*x^7 - 7371*a^5*c^3*x^5 + 26495*a^
3*c^3*x^3 - 226905*a*c^3*x)*arcsin(a*x) - (33750*a^6*c^3*x^6 - 269082*a^4*c
^3*x^4 + 1495874*a^2*c^3*x^2 - 44658302*c^3 - 11025*(75*a^6*c^3*x^6 - 351*a
^4*c^3*x^4 + 757*a^2*c^3*x^2 - 2161*c^3)*arcsin(a*x)^2)*sqrt(-a^2*x^2 + 1))
/a
```

Sympy [A] time = 25.7385, size = 355, normalized size = 0.96

$$\begin{cases} -\frac{a^6c^3x^7\operatorname{asin}^3(ax)}{7} + \frac{6a^6c^3x^7\operatorname{asin}(ax)}{343} - \frac{3a^5c^3x^6\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{49} + \frac{6a^5c^3x^6\sqrt{-a^2x^2+1}}{2401} + \frac{3a^4c^3x^5\operatorname{asin}^3(ax)}{5} - \frac{702a^4c^3x^5\operatorname{asin}(ax)}{6125} + \frac{351a^3c \ldots}{} \\ 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**3*asin(a*x)**3,x)
```

```
[Out] Piecewise((-a**6*c**3*x**7*asin(a*x)**3/7 + 6*a**6*c**3*x**7*asin(a*x)/343
- 3*a**5*c**3*x**6*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/49 + 6*a**5*c**3*x**6*
sqrt(-a**2*x**2 + 1)/2401 + 3*a**4*c**3*x**5*asin(a*x)**3/5 - 702*a**4*c**3
*x**5*asin(a*x)/6125 + 351*a**3*c**3*x**4*sqrt(-a**2*x**2 + 1)*asin(a*x)**2
/1225 - 29898*a**3*c**3*x**4*sqrt(-a**2*x**2 + 1)/1500625 - a**2*c**3*x**3*
asin(a*x)**3 + 1514*a**2*c**3*x**3*asin(a*x)/3675 - 757*a*c**3*x**2*sqrt(-a
**2*x**2 + 1)*asin(a*x)**2/1225 + 1495874*a*c**3*x**2*sqrt(-a**2*x**2 + 1)/
13505625 + c**3*x*asin(a*x)**3 - 4322*c**3*x*asin(a*x)/1225 + 2161*c**3*sqr
t(-a**2*x**2 + 1)*asin(a*x)**2/(1225*a) - 44658302*c**3*sqrt(-a**2*x**2 + 1
)/(13505625*a), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.45968, size = 512, normalized size = 1.38

$$-\frac{1}{7}\left(a^2x^2-1\right)^3c^3x\arcsin\left(ax\right)^3+\frac{6}{35}\left(a^2x^2-1\right)^2c^3x\arcsin\left(ax\right)^3+\frac{6}{343}\left(a^2x^2-1\right)^3c^3x\arcsin\left(ax\right)-\frac{8}{35}\left(a^2x^2-1\right)c^3x\arc$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] -1/7*(a^2*x^2 - 1)^3*c^3*x*arcsin(a*x)^3 + 6/35*(a^2*x^2 - 1)^2*c^3*x*arcsi
n(a*x)^3 + 6/343*(a^2*x^2 - 1)^3*c^3*x*arcsin(a*x) - 8/35*(a^2*x^2 - 1)*c^3
*x*arcsin(a*x)^3 - 3/49*(a^2*x^2 - 1)^3*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^
2/a - 2664/42875*(a^2*x^2 - 1)^2*c^3*x*arcsin(a*x) + 16/35*c^3*x*arcsin(a*x
)^3 + 18/175*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^2/a + 30256
/128625*(a^2*x^2 - 1)*c^3*x*arcsin(a*x) + 6/2401*(a^2*x^2 - 1)^3*sqrt(-a^2*
x^2 + 1)*c^3/a + 8/35*(-a^2*x^2 + 1)^(3/2)*c^3*arcsin(a*x)^2/a - 413312/128
625*c^3*x*arcsin(a*x) - 2664/214375*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^3/
a + 48/35*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^2/a - 30256/385875*(-a^2*x^2 +
 1)^(3/2)*c^3/a - 413312/128625*sqrt(-a^2*x^2 + 1)*c^3/a
```

3.290 $\int \left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^3\,dx$

Optimal. Leaf size=273

$$-\frac{6c^2\left(1-a^2x^2\right)^{5/2}}{625a}-\frac{272c^2\left(1-a^2x^2\right)^{3/2}}{3375a}-\frac{4144c^2\sqrt{1-a^2x^2}}{1125a}-\frac{6}{125}a^4c^2x^5\sin^{-1}(ax)+\frac{76}{225}a^2c^2x^3\sin^{-1}(ax)+\frac{1}{5}c^2x\left(1\right.$$

```
[Out] (-4144*c^2*Sqrt[1 - a^2*x^2])/(1125*a) - (272*c^2*(1 - a^2*x^2)^(3/2))/(337
5*a) - (6*c^2*(1 - a^2*x^2)^(5/2))/(625*a) - (298*c^2*x*ArcSin[a*x])/75 + (
76*a^2*c^2*x^3*ArcSin[a*x])/225 - (6*a^4*c^2*x^5*ArcSin[a*x])/125 + (8*c^2*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(5*a) + (4*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[
a*x]^2)/(15*a) + (3*c^2*(1 - a^2*x^2)^(5/2)*ArcSin[a*x]^2)/(25*a) + (8*c^2*
x*ArcSin[a*x]^3)/15 + (4*c^2*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/15 + (c^2*x*(1
- a^2*x^2)^2*ArcSin[a*x]^3)/5
```

Rubi [A] time = 0.40738, antiderivative size = 273, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.55, Rules used = {4649, 4619, 4677, 261, 4645, 444, 43, 194, 12, 1247, 698}

$$-\frac{6c^2\left(1-a^2x^2\right)^{5/2}}{625a}-\frac{272c^2\left(1-a^2x^2\right)^{3/2}}{3375a}-\frac{4144c^2\sqrt{1-a^2x^2}}{1125a}-\frac{6}{125}a^4c^2x^5\sin^{-1}(ax)+\frac{76}{225}a^2c^2x^3\sin^{-1}(ax)+\frac{1}{5}c^2x\left(1\right.$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^2*ArcSin[a*x]^3,x]
```


```
[Out] (-4144*c^2*Sqrt[1 - a^2*x^2])/(1125*a) - (272*c^2*(1 - a^2*x^2)^(3/2))/(337
5*a) - (6*c^2*(1 - a^2*x^2)^(5/2))/(625*a) - (298*c^2*x*ArcSin[a*x])/75 + (
76*a^2*c^2*x^3*ArcSin[a*x])/225 - (6*a^4*c^2*x^5*ArcSin[a*x])/125 + (8*c^2*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(5*a) + (4*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[
a*x]^2)/(15*a) + (3*c^2*(1 - a^2*x^2)^(5/2)*ArcSin[a*x]^2)/(25*a) + (8*c^2*
x*ArcSin[a*x]^3)/15 + (4*c^2*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/15 + (c^2*x*(1
- a^2*x^2)^2*ArcSin[a*x]^3)/5
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
```

```
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^3\,dx = \frac{1}{5}c^2x\left(1-a^2x^2\right)^2 \sin^{-1}(ax)^3 + \frac{1}{5}(4c)\int \left(c-a^2cx^2\right)\sin^{-1}(ax)^3\,dx - \frac{1}{5}\left(3ac^2\right)\int x\left(1-a\right.$$
$$= \frac{3c^2\left(1-a^2x^2\right)^{5/2}\sin^{-1}(ax)^2}{25a} + \frac{4}{15}c^2x\left(1-a^2x^2\right)\sin^{-1}(ax)^3 + \frac{1}{5}c^2x\left(1-a^2x^2\right)^2\sin^{-1}(a$$
$$= -\frac{6}{25}c^2x\sin^{-1}(ax) + \frac{4}{25}a^2c^2x^3\sin^{-1}(ax) - \frac{6}{125}a^4c^2x^5\sin^{-1}(ax) + \frac{4c^2\left(1-a^2x^2\right)^{3/2}\sin}{15a}$$
$$= -\frac{58}{75}c^2x\sin^{-1}(ax) + \frac{76}{225}a^2c^2x^3\sin^{-1}(ax) - \frac{6}{125}a^4c^2x^5\sin^{-1}(ax) + \frac{8c^2\sqrt{1-a^2x^2}\sin^{-1}}{5a}$$
$$= -\frac{298}{75}c^2x\sin^{-1}(ax) + \frac{76}{225}a^2c^2x^3\sin^{-1}(ax) - \frac{6}{125}a^4c^2x^5\sin^{-1}(ax) + \frac{8c^2\sqrt{1-a^2x^2}\sin}{5a}$$
$$= -\frac{16c^2\sqrt{1-a^2x^2}}{5a} - \frac{298}{75}c^2x\sin^{-1}(ax) + \frac{76}{225}a^2c^2x^3\sin^{-1}(ax) - \frac{6}{125}a^4c^2x^5\sin^{-1}(ax) +$$
$$= -\frac{4144c^2\sqrt{1-a^2x^2}}{1125a} - \frac{272c^2\left(1-a^2x^2\right)^{3/2}}{3375a} - \frac{6c^2\left(1-a^2x^2\right)^{5/2}}{625a} - \frac{298}{75}c^2x\sin^{-1}(ax) + \frac{76}{22}$$

Mathematica [A] time = 0.215761, size = 139, normalized size = 0.51

$$\frac{c^2\left(-2\sqrt{1-a^2x^2}\left(81a^4x^4-842a^2x^2+31841\right)+1125ax\left(3a^4x^4-10a^2x^2+15\right)\sin^{-1}(ax)^3+225\sqrt{1-a^2x^2}\left(9a^4x^4-38\right.\right.}{16875a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^2*ArcSin[a*x]^3,x]
```

```
[Out] (c^2*(-2*Sqrt[1 - a^2*x^2]*(31841 - 842*a^2*x^2 + 81*a^4*x^4) - 30*a*x*(223
5 - 190*a^2*x^2 + 27*a^4*x^4)*ArcSin[a*x] + 225*Sqrt[1 - a^2*x^2]*(149 - 38
*a^2*x^2 + 9*a^4*x^4)*ArcSin[a*x]^2 + 1125*a*x*(15 - 10*a^2*x^2 + 3*a^4*x^4
)*ArcSin[a*x]^3))/(16875*a)
```

Maple [A] time = 0.052, size = 206, normalized size = 0.8

$$\frac{c^2}{16875\,a}\left(3375\,(\arcsin(ax))^3\,a^5x^5 + 2025\,(\arcsin(ax))^2\sqrt{-a^2x^2+1}a^4x^4 - 11250\,(\arcsin(ax))^3\,a^3x^3 - 810\,a^5x^5\,\mathrm{arcs}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x)
```

```
[Out] 1/16875/a*c^2*(3375*arcsin(a*x)^3*a^5*x^5+2025*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)*a^4*x^4-11250*arcsin(a*x)^3*a^3*x^3-810*a^5*x^5*arcsin(a*x)-8550*arcsi
n(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x^2-162*a^4*x^4*(-a^2*x^2+1)^(1/2)+16875*a*
x*arcsin(a*x)^3+5700*a^3*x^3*arcsin(a*x)+33525*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)+1684*a^2*x^2*(-a^2*x^2+1)^(1/2)-67050*a*x*arcsin(a*x)-63682*(-a^2*x^2+
1)^(1/2))
```

Maxima [A] time = 1.57211, size = 292, normalized size = 1.07

$$\frac{1}{75}\left(9\sqrt{-a^2x^2+1}a^2c^2x^4-38\sqrt{-a^2x^2+1}c^2x^2+\frac{149\sqrt{-a^2x^2+1}c^2}{a^2}\right)a\arcsin(ax)^2+\frac{1}{15}\left(3a^4c^2x^5-10a^2c^2x^3+15c^2x\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/75*(9*sqrt(-a^2*x^2 + 1)*a^2*c^2*x^4 - 38*sqrt(-a^2*x^2 + 1)*c^2*x^2 + 14
9*sqrt(-a^2*x^2 + 1)*c^2/a^2)*a*arcsin(a*x)^2 + 1/15*(3*a^4*c^2*x^5 - 10*a^
2*c^2*x^3 + 15*c^2*x)*arcsin(a*x)^3 - 2/16875*(81*sqrt(-a^2*x^2 + 1)*a^2*c^
2*x^4 - 842*sqrt(-a^2*x^2 + 1)*c^2*x^2 + 15*(27*a^4*c^2*x^5 - 190*a^2*c^2*x
^3 + 2235*c^2*x)*arcsin(a*x)/a + 31841*sqrt(-a^2*x^2 + 1)*c^2/a^2)*a
```

Fricas [A] time = 1.71337, size = 375, normalized size = 1.37

$$\frac{1125\left(3a^5c^2x^5-10a^3c^2x^3+15ac^2x\right)\arcsin(ax)^3-30\left(27a^5c^2x^5-190a^3c^2x^3+2235ac^2x\right)\arcsin(ax)-\left(162a^4c^2x^4-\right.}{16875a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] 1/16875*(1125*(3*a^5*c^2*x^5 - 10*a^3*c^2*x^3 + 15*a*c^2*x)*arcsin(a*x)^3 -
 30*(27*a^5*c^2*x^5 - 190*a^3*c^2*x^3 + 2235*a*c^2*x)*arcsin(a*x) - (162*a^
4*c^2*x^4 - 1684*a^2*c^2*x^2 - 225*(9*a^4*c^2*x^4 - 38*a^2*c^2*x^2 + 149*c^
2)*arcsin(a*x)^2 + 63682*c^2)*sqrt(-a^2*x^2 + 1))/a
```

Sympy [A] time = 8.79385, size = 262, normalized size = 0.96

$$\begin{cases}\frac{a^4c^2x^5\operatorname{asin}^3(ax)}{5}-\frac{6a^4c^2x^5\operatorname{asin}(ax)}{125}+\frac{3a^3c^2x^4\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{25}-\frac{6a^3c^2x^4\sqrt{-a^2x^2+1}}{625}-\frac{2a^2c^2x^3\operatorname{asin}^3(ax)}{3}+\frac{76a^2c^2x^3\operatorname{asin}(ax)}{225}-\frac{38ac^2x^2\sqrt{-a^2x}}{7} \\ 0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**2*asin(a*x)**3,x)
```

```
[Out] Piecewise((a**4*c**2*x**5*asin(a*x)**3/5 - 6*a**4*c**2*x**5*asin(a*x)/125 +
 3*a**3*c**2*x**4*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/25 - 6*a**3*c**2*x**4*s
qrt(-a**2*x**2 + 1)/625 - 2*a**2*c**2*x**3*asin(a*x)**3/3 + 76*a**2*c**2*x*
*3*asin(a*x)/225 - 38*a*c**2*x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/75 + 16
84*a*c**2*x**2*sqrt(-a**2*x**2 + 1)/16875 + c**2*x*asin(a*x)**3 - 298*c**2*
x*asin(a*x)/75 + 149*c**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(75*a) - 63682*
c**2*sqrt(-a**2*x**2 + 1)/(16875*a), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.44186, size = 360, normalized size = 1.32

$$\frac{1}{5}\left(a^2x^2-1\right)^2c^2x\arcsin(ax)^3-\frac{4}{15}\left(a^2x^2-1\right)c^2x\arcsin(ax)^3-\frac{6}{125}\left(a^2x^2-1\right)^2c^2x\arcsin(ax)+\frac{8}{15}c^2x\arcsin(ax)^3+\frac{3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] 1/5*(a^2*x^2 - 1)^2*c^2*x*arcsin(a*x)^3 - 4/15*(a^2*x^2 - 1)*c^2*x*arcsin(a
*x)^3 - 6/125*(a^2*x^2 - 1)^2*c^2*x*arcsin(a*x) + 8/15*c^2*x*arcsin(a*x)^3
+ 3/25*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^2*arcsin(a*x)^2/a + 272/1125*(a
^2*x^2 - 1)*c^2*x*arcsin(a*x) + 4/15*(-a^2*x^2 + 1)^(3/2)*c^2*arcsin(a*x)^2
/a - 4144/1125*c^2*x*arcsin(a*x) - 6/625*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)
*c^2/a + 8/5*sqrt(-a^2*x^2 + 1)*c^2*arcsin(a*x)^2/a - 272/3375*(-a^2*x^2 +
1)^(3/2)*c^2/a - 4144/1125*sqrt(-a^2*x^2 + 1)*c^2/a
```

3.291 $\int \left(c-a^2cx^2\right)\sin^{-1}(ax)^3\,dx$

Optimal. Leaf size=158

$$-\frac{2c\left(1-a^2x^2\right)^{3/2}}{27a}-\frac{40c\sqrt{1-a^2x^2}}{9a}+\frac{2}{9}a^2cx^3\sin^{-1}(ax)+\frac{1}{3}cx\left(1-a^2x^2\right)\sin^{-1}(ax)^3+\frac{c\left(1-a^2x^2\right)^{3/2}\sin^{-1}(ax)^2}{3a}+\frac{2c\sqrt{1-}}{}$$

```
[Out] (-40*c*Sqrt[1 - a^2*x^2])/(9*a) - (2*c*(1 - a^2*x^2)^(3/2))/(27*a) - (14*c*
x*ArcSin[a*x])/3 + (2*a^2*c*x^3*ArcSin[a*x])/9 + (2*c*Sqrt[1 - a^2*x^2]*Arc
Sin[a*x]^2)/a + (c*(1 - a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(3*a) + (2*c*x*ArcSin
[a*x]^3)/3 + (c*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/3
```

Rubi [A] time = 0.210908, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4649, 4619, 4677, 261, 4645, 444, 43}

$$-\frac{2c\left(1-a^2x^2\right)^{3/2}}{27a}-\frac{40c\sqrt{1-a^2x^2}}{9a}+\frac{2}{9}a^2cx^3\sin^{-1}(ax)+\frac{1}{3}cx\left(1-a^2x^2\right)\sin^{-1}(ax)^3+\frac{c\left(1-a^2x^2\right)^{3/2}\sin^{-1}(ax)^2}{3a}+\frac{2c\sqrt{1-}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)*ArcSin[a*x]^3,x]
```


```
[Out] (-40*c*Sqrt[1 - a^2*x^2])/(9*a) - (2*c*(1 - a^2*x^2)^(3/2))/(27*a) - (14*c*
x*ArcSin[a*x])/3 + (2*a^2*c*x^3*ArcSin[a*x])/9 + (2*c*Sqrt[1 - a^2*x^2]*Arc
Sin[a*x]^2)/a + (c*(1 - a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(3*a) + (2*c*x*ArcSin
[a*x]^3)/3 + (c*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/3
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \left(c-a^2cx^2\right)\sin^{-1}(ax)^3\,dx &= \frac{1}{3}cx\left(1-a^2x^2\right)\sin^{-1}(ax)^3+\frac{1}{3}(2c)\int \sin^{-1}(ax)^3\,dx-(ac)\int x\sqrt{1-a^2x^2}\sin^{-1}(ax)^2\,dx \\
&= \frac{c\left(1-a^2x^2\right)^{3/2}\sin^{-1}(ax)^2}{3a}+\frac{2}{3}cx\sin^{-1}(ax)^3+\frac{1}{3}cx\left(1-a^2x^2\right)\sin^{-1}(ax)^3-\frac{1}{3}(2c)\int \left(1-\right. \\
&= -\frac{2}{3}cx\sin^{-1}(ax)+\frac{2}{9}a^2cx^3\sin^{-1}(ax)+\frac{2c\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a}+\frac{c\left(1-a^2x^2\right)^{3/2}\sin^{-1}(a}{3a} \\
&= -\frac{14}{3}cx\sin^{-1}(ax)+\frac{2}{9}a^2cx^3\sin^{-1}(ax)+\frac{2c\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a}+\frac{c\left(1-a^2x^2\right)^{3/2}\sin^{-1}(}{3a} \\
&= -\frac{4c\sqrt{1-a^2x^2}}{a}-\frac{14}{3}cx\sin^{-1}(ax)+\frac{2}{9}a^2cx^3\sin^{-1}(ax)+\frac{2c\sqrt{1-a^2x^2}\sin^{-1}(ax)^2}{a}+\frac{c\left(1-\right.}{} \\
&= -\frac{40c\sqrt{1-a^2x^2}}{9a}-\frac{2c\left(1-a^2x^2\right)^{3/2}}{27a}-\frac{14}{3}cx\sin^{-1}(ax)+\frac{2}{9}a^2cx^3\sin^{-1}(ax)+\frac{2c\sqrt{1-a^2x^2}}{a}
\end{aligned}$$

Mathematica [A] time = 0.0896877, size = 101, normalized size = 0.64

$$\frac{c\left(2\sqrt{1-a^2x^2}\left(a^2x^2-61\right)-9ax\left(a^2x^2-3\right)\sin^{-1}(ax)^3-9\sqrt{1-a^2x^2}\left(a^2x^2-7\right)\sin^{-1}(ax)^2+6ax\left(a^2x^2-21\right)\sin^{-1}(ax)\right.}{27a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)*ArcSin[a*x]^3,x]
```

```
[Out] (c*(2*Sqrt[1 - a^2*x^2]*(-61 + a^2*x^2) + 6*a*x*(-21 + a^2*x^2)*ArcSin[a*x]
 - 9*Sqrt[1 - a^2*x^2]*(-7 + a^2*x^2)*ArcSin[a*x]^2 - 9*a*x*(-3 + a^2*x^2)*
ArcSin[a*x]^3))/(27*a)
```

Maple [A] time = 0.041, size = 132, normalized size = 0.8

$$-\frac{c}{27\,a}\left(9\,\left(\arcsin\left(ax\right)\right)^{3}a^{3}x^{3}+9\,\left(\arcsin\left(ax\right)\right)^{2}\sqrt{-a^{2}x^{2}+1}a^{2}x^{2}-27\,ax\left(\arcsin\left(ax\right)\right)^{3}-6\,a^{3}x^{3}\arcsin\left(ax\right)-63\,\left(\arcsin\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)*arcsin(a*x)^3,x)
```

```
[Out] -1/27/a*c*(9*arcsin(a*x)^3*a^3*x^3+9*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x
^2-27*a*x*arcsin(a*x)^3-6*a^3*x^3*arcsin(a*x)-63*arcsin(a*x)^2*(-a^2*x^2+1)
^(1/2)-2*a^2*x^2*(-a^2*x^2+1)^(1/2)+126*a*x*arcsin(a*x)+122*(-a^2*x^2+1)^(1
/2))
```

Maxima [A] time = 1.58552, size = 173, normalized size = 1.09

$$-\frac{1}{3}\left(\sqrt{-a^{2}x^{2}+1}cx^{2}-\frac{7\sqrt{-a^{2}x^{2}+1}c}{a^{2}}\right)a\arcsin\left(ax\right)^{2}-\frac{1}{3}\left(a^{2}cx^{3}-3\,cx\right)\arcsin\left(ax\right)^{3}+\frac{2}{27}\left(\sqrt{-a^{2}x^{2}+1}cx^{2}+\frac{3\left(a^{2}cx^{3}-2\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*c*x^2 - 7*sqrt(-a^2*x^2 + 1)*c/a^2)*a*arcsin(a*x)^
2 - 1/3*(a^2*c*x^3 - 3*c*x)*arcsin(a*x)^3 + 2/27*(sqrt(-a^2*x^2 + 1)*c*x^2
+ 3*(a^2*c*x^3 - 21*c*x)*arcsin(a*x)/a - 61*sqrt(-a^2*x^2 + 1)*c/a^2)*a
```

Fricas [A] time = 1.61613, size = 225, normalized size = 1.42

$$-\frac{9\left(a^{3}cx^{3}-3\,acx\right)\arcsin\left(ax\right)^{3}-6\left(a^{3}cx^{3}-21\,acx\right)\arcsin\left(ax\right)-\left(2\,a^{2}cx^{2}-9\left(a^{2}cx^{2}-7\,c\right)\arcsin\left(ax\right)^{2}-122\,c\right)\sqrt{-a^{2}x^{2}}}{27\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/27*(9*(a^3*c*x^3 - 3*a*c*x)*arcsin(a*x)^3 - 6*(a^3*c*x^3 - 21*a*c*x)*arc
sin(a*x) - (2*a^2*c*x^2 - 9*(a^2*c*x^2 - 7*c)*arcsin(a*x)^2 - 122*c)*sqrt(-
a^2*x^2 + 1))/a
```

Sympy [A] time = 2.45054, size = 150, normalized size = 0.95

$$\begin{cases}-\frac{a^{2}cx^{3}\operatorname{asin}^{3}(ax)}{3}+\frac{2a^{2}cx^{3}\operatorname{asin}(ax)}{9}-\frac{acx^{2}\sqrt{-a^{2}x^{2}+1}\operatorname{asin}^{2}(ax)}{3}+\frac{2acx^{2}\sqrt{-a^{2}x^{2}+1}}{27}+cx\operatorname{asin}^{3}(ax)-\frac{14cx\operatorname{asin}(ax)}{3}+\frac{7c\sqrt{-a^{2}x^{2}+1}\operatorname{asin}^{2}(ax)}{3a}- \\ 0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)*asin(a*x)**3,x)
```

```
[Out] Piecewise((-a**2*c*x**3*asin(a*x)**3/3 + 2*a**2*c*x**3*asin(a*x)/9 - a*c*x*
*2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/3 + 2*a*c*x**2*sqrt(-a**2*x**2 + 1)/27
 + c*x*asin(a*x)**3 - 14*c*x*asin(a*x)/3 + 7*c*sqrt(-a**2*x**2 + 1)*asin(a*
x)**2/(3*a) - 122*c*sqrt(-a**2*x**2 + 1)/(27*a), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.38332, size = 188, normalized size = 1.19

$$-\frac{1}{3}\left(a^2x^2-1\right)cx\arcsin\left(ax\right)^3+\frac{2}{3}cx\arcsin\left(ax\right)^3+\frac{2}{9}\left(a^2x^2-1\right)cx\arcsin\left(ax\right)+\frac{\left(-a^2x^2+1\right)^{\frac{3}{2}}c\arcsin\left(ax\right)^2}{3a}-\frac{40}{9}cx\,a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] -1/3*(a^2*x^2 - 1)*c*x*arcsin(a*x)^3 + 2/3*c*x*arcsin(a*x)^3 + 2/9*(a^2*x^2
 - 1)*c*x*arcsin(a*x) + 1/3*(-a^2*x^2 + 1)^(3/2)*c*arcsin(a*x)^2/a - 40/9*c
*x*arcsin(a*x) + 2*sqrt(-a^2*x^2 + 1)*c*arcsin(a*x)^2/a - 2/27*(-a^2*x^2 +
1)^(3/2)*c/a - 40/9*sqrt(-a^2*x^2 + 1)*c/a
```

3.292 $\int \frac{\sin^{-1}(ax)^3}{c-a^2cx^2}\,dx$

Optimal. Leaf size=200

$$\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\sin^{-1}(ax)}\right)}{ac}-\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\sin^{-1}(ax)}\right)}{ac}-\frac{6\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}(ax)}\right)}{ac}+$$

```
[Out] ((-2*I)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c) + ((3*I)*ArcSin[a*x]
^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c) - ((3*I)*ArcSin[a*x]^2*PolyLog
[2, I*E^(I*ArcSin[a*x])])/(a*c) - (6*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSi
n[a*x])])/(a*c) + (6*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(a*c) - (
(6*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c) + ((6*I)*PolyLog[4, I*E^(I*
ArcSin[a*x])])/(a*c)
```

Rubi [A] time = 0.13375, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4657, 4181, 2531, 6609, 2282, 6589}

$$\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\sin^{-1}(ax)}\right)}{ac}-\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\sin^{-1}(ax)}\right)}{ac}-\frac{6\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}(ax)}\right)}{ac}+$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2),x]
```


```
[Out] ((-2*I)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c) + ((3*I)*ArcSin[a*x]
^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c) - ((3*I)*ArcSin[a*x]^2*PolyLog
[2, I*E^(I*ArcSin[a*x])])/(a*c) - (6*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSi
n[a*x])])/(a*c) + (6*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(a*c) - (
(6*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c) + ((6*I)*PolyLog[4, I*E^(I*
ArcSin[a*x])])/(a*c)
```


Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{c-a^2cx^2}\,dx = \frac{\text{Subst}\left(\int x^3\sec(x)\,dx, x, \sin^{-1}(ax)\right)}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3\,\text{Subst}\left(\int x^2\log\left(1-ie^{ix}\right)dx, x, \sin^{-1}(ax)\right)}{ac} + \frac{3\,\text{Subst}\left(\int x^2\right.}{}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(ie^{i\sin^{-1}(ax)}\right)}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(ie^{i\sin^{-1}(ax)}\right)}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(ie^{i\sin^{-1}(ax)}\right)}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(ie^{i\sin^{-1}(ax)}\right)}{ac}$$

Mathematica [A] time = 0.181513, size = 162, normalized size = 0.81

$$-\frac{i\left(-3\sin^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\sin^{-1}(ax)}\right)+3\sin^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\sin^{-1}(ax)}\right)-6i\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}\right.}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2),x]
```

```
[Out] ((-I)*(2*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])] - 3*ArcSin[a*x]^2*PolyLog[
2, (-I)*E^(I*ArcSin[a*x])] + 3*ArcSin[a*x]^2*PolyLog[2, I*E^(I*ArcSin[a*x])
] - (6*I)*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])] + (6*I)*ArcSin[a*x
]*PolyLog[3, I*E^(I*ArcSin[a*x])] + 6*PolyLog[4, (-I)*E^(I*ArcSin[a*x])] -
6*PolyLog[4, I*E^(I*ArcSin[a*x])]))/(a*c)
```

Maple [F] time = 0.1, size = 0, normalized size = 0.

$$\int \frac{(\arcsin(ax))^3}{-a^2cx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c),x)
```

```
[Out] int(arcsin(a*x)^3/(-a^2*c*x^2+c),x)
```

Maxima [A] time = 2.24713, size = 49, normalized size = 0.24

$$\frac{1}{2}\left(\frac{\log(ax+1)}{ac}-\frac{\log(ax-1)}{ac}\right)\arcsin(ax)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] 1/2*(log(a*x + 1)/(a*c) - log(a*x - 1)/(a*c))*arcsin(a*x)^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\arcsin(ax)^3}{a^2cx^2-c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(-arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{\operatorname{asin}^3(ax)}{a^2x^2-1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c),x)
```

```
[Out] -Integral(asin(a*x)**3/(a**2*x**2 - 1), x)/c
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\arcsin(ax)^3}{a^2cx^2-c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(-arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

3.293 $\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=337

$$\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\sin^{-1}(ax)}\right)}{2ac^2}-\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\sin^{-1}(ax)}\right)}{2ac^2}-\frac{3\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}(ax)}\right)}{ac^2}+$$

```
[Out] (-3*ArcSin[a*x]^2)/(2*a*c^2*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(2*c^2*(
1 - a^2*x^2)) - ((6*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) - (I*
ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) + ((3*I)*PolyLog[2, (-I)*E
^(I*ArcSin[a*x])])/(a*c^2) + (((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, (-I)*E^(I*
ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) -
(((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) - (3*ArcS
in[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])/(a*c^2) + (3*ArcSin[a*x]*PolyLo
g[3, I*E^(I*ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x
])])/(a*c^2) + ((3*I)*PolyLog[4, I*E^(I*ArcSin[a*x])])/(a*c^2)
```

Rubi [A] time = 0.296223, antiderivative size = 337, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4655, 4657, 4181, 2531, 6609, 2282, 6589, 4677, 2279, 2391}

$$\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\sin^{-1}(ax)}\right)}{2ac^2}-\frac{3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\sin^{-1}(ax)}\right)}{2ac^2}-\frac{3\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}(ax)}\right)}{ac^2}+$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^2,x]
```


```
[Out] (-3*ArcSin[a*x]^2)/(2*a*c^2*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(2*c^2*(
1 - a^2*x^2)) - ((6*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) - (I*
ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) + ((3*I)*PolyLog[2, (-I)*E
^(I*ArcSin[a*x])])/(a*c^2) + (((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, (-I)*E^(I*
ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) -
(((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) - (3*ArcS
in[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])/(a*c^2) + (3*ArcSin[a*x]*PolyLo
g[3, I*E^(I*ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x
])])/(a*c^2) + ((3*I)*PolyLog[4, I*E^(I*ArcSin[a*x])])/(a*c^2)
```


Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{(c-a^2cx^2)^2}\,dx = \frac{x\sin^{-1}(ax)^3}{2c^2(1-a^2x^2)} - \frac{(3a)\int \frac{x\sin^{-1}(ax)^2}{(1-a^2x^2)^{3/2}}\,dx}{2c^2} + \frac{\int \frac{\sin^{-1}(ax)^3}{c-a^2cx^2}\,dx}{2c}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2(1-a^2x^2)} + \frac{3\int \frac{\sin^{-1}(ax)}{1-a^2x^2}\,dx}{c^2} + \frac{\text{Subst}\left(\int x^3\sec(x)\,dx, x, \sin^{-1}(ax)\right)}{2ac^2}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2(1-a^2x^2)} - \frac{i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{3\,\text{Subst}\left(\int x^2\log\left(1-ie^{ix}\right)dx\right.}{2ac^2}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2}$$

Mathematica [A] time = 0.403695, size = 234, normalized size = 0.69

$$-6\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}(ax)}\right) + 6\sin^{-1}(ax)\text{PolyLog}\left(3,ie^{i\sin^{-1}(ax)}\right) + 3i\left(\sin^{-1}(ax)^2+2\right)\text{PolyLog}\left(2,-ie^{i\sin^{-1}(a}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^2,x]
```

```
[Out] ((-3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2] + (a*x*ArcSin[a*x]^3)/(1 - a^2*x^2) -
 (12*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])] - (2*I)*ArcSin[a*x]^3*ArcTan[
E^(I*ArcSin[a*x])] + (3*I)*(2 + ArcSin[a*x]^2)*PolyLog[2, (-I)*E^(I*ArcSin[
a*x])] - (3*I)*(2 + ArcSin[a*x]^2)*PolyLog[2, I*E^(I*ArcSin[a*x])] - 6*ArcS
in[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])] + 6*ArcSin[a*x]*PolyLog[3, I*E^(
I*ArcSin[a*x])] - (6*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])] + (6*I)*PolyLog[
4, I*E^(I*ArcSin[a*x])])/(2*a*c^2)
```

Maple [A] time = 0.149, size = 486, normalized size = 1.4

$$-\frac{x(\arcsin(ax))^3}{(2a^2x^2-2)c^2} + \frac{3(\arcsin(ax))^2}{2a(a^2x^2-1)c^2}\sqrt{-a^2x^2+1} - \frac{(\arcsin(ax))^3}{2ac^2}\ln\left(1+i\left(iax+\sqrt{-a^2x^2+1}\right)\right) + \frac{\frac{3i}{2}(\arcsin(ax))^2}{ac^2}\text{polyl}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x)
```

```
[Out] -1/2/(a^2*x^2-1)*arcsin(a*x)^3/c^2*x+3/2/a/(a^2*x^2-1)*arcsin(a*x)^2/c^2*(-
a^2*x^2+1)^(1/2)-1/2/a/c^2*arcsin(a*x)^3*ln(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))
```

```
+3/2*I*arcsin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2-3*arcsi
n(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2-3*I*polylog(4,-I*(I*a
*x+(-a^2*x^2+1)^(1/2)))/a/c^2+1/2/a/c^2*arcsin(a*x)^3*ln(1-I*(I*a*x+(-a^2*x
^2+1)^(1/2)))-3/2*I*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a
/c^2+3*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2+3*I*polylo
g(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2-3/a/c^2*arcsin(a*x)*ln(1+I*(I*a*x+(
-a^2*x^2+1)^(1/2)))+3/a/c^2*arcsin(a*x)*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))+
3*I/a/c^2*dilog(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3*I/a/c^2*dilog(1-I*(I*a*x+
(-a^2*x^2+1)^(1/2)))
```

Maxima [A] time = 2.65373, size = 77, normalized size = 0.23

$$-\frac{1}{4}\left(\frac{2\,x}{a^2c^2x^2-c^2}-\frac{\log\left(ax+1\right)}{ac^2}+\frac{\log\left(ax-1\right)}{ac^2}\right)\arcsin\left(ax\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] -1/4*(2*x/(a^2*c^2*x^2 - c^2) - log(a*x + 1)/(a*c^2) + log(a*x - 1)/(a*c^2)
)*arcsin(a*x)^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\arcsin\left(ax\right)^3}{a^4c^2x^4-2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arcsin(a*x)^3/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{\operatorname{asin}^{3}\left(ax\right)}{a^4x^4-2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(asin(a*x)**3/(a**4*x**4 - 2*a**2*x**2 + 1), x)/c**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\arcsin\left(ax\right)^3}{\left(a^2cx^2-c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(a^2*c*x^2 - c)^2, x)
```

3.294 $\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^3} dx$

Optimal. Leaf size=455

$$\frac{9i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\sin^{-1}(ax)}\right)}{8ac^3}-\frac{9i\sin^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\sin^{-1}(ax)}\right)}{8ac^3}-\frac{9\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}(ax)}\right)}{4ac^3}$$

```
[Out] -1/(4*a*c^3*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x])/(4*c^3*(1 - a^2*x^2)) - Ar
cSin[a*x]^2/(4*a*c^3*(1 - a^2*x^2)^(3/2)) - (9*ArcSin[a*x]^2)/(8*a*c^3*Sqrt
[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(4*c^3*(1 - a^2*x^2)^2) + (3*x*ArcSin[a*
x]^3)/(8*c^3*(1 - a^2*x^2)) - ((5*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])])
/(a*c^3) - (((3*I)/4)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^3) + ((
(5*I)/2)*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/8)*ArcSin[a*
x]^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) - (((5*I)/2)*PolyLog[2, I*
E^(I*ArcSin[a*x])])/(a*c^3) - (((9*I)/8)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*Ar
cSin[a*x])])/(a*c^3) - (9*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])/(
4*a*c^3) + (9*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(4*a*c^3) - (((9
*I)/4)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/4)*PolyLog[4,
I*E^(I*ArcSin[a*x])])/(a*c^3)
```

Rubi [A] time = 0.507124, antiderivative size = 455, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.55, Rules used = {4655, 4657, 4181, 2531, 6609, 2282, 6589, 4677, 2279, 2391, 261}

$$\frac{9i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\sin^{-1}(ax)}\right)}{8ac^3}-\frac{9i\sin^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\sin^{-1}(ax)}\right)}{8ac^3}-\frac{9\sin^{-1}(ax)\text{PolyLog}\left(3,-ie^{i\sin^{-1}(ax)}\right)}{4ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^3,x]
```


```
[Out] -1/(4*a*c^3*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x])/(4*c^3*(1 - a^2*x^2)) - Ar
cSin[a*x]^2/(4*a*c^3*(1 - a^2*x^2)^(3/2)) - (9*ArcSin[a*x]^2)/(8*a*c^3*Sqrt
[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(4*c^3*(1 - a^2*x^2)^2) + (3*x*ArcSin[a*
x]^3)/(8*c^3*(1 - a^2*x^2)) - ((5*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])])
/(a*c^3) - (((3*I)/4)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^3) + ((
(5*I)/2)*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/8)*ArcSin[a*
x]^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) - (((5*I)/2)*PolyLog[2, I*
E^(I*ArcSin[a*x])])/(a*c^3) - (((9*I)/8)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*Ar
cSin[a*x])])/(a*c^3) - (9*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])/(
4*a*c^3) + (9*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(4*a*c^3) - (((9
*I)/4)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/4)*PolyLog[4,
I*E^(I*ArcSin[a*x])])/(a*c^3)
```


Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

```
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^3}\,dx = \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} - \frac{(3a)\int \frac{x\sin^{-1}(ax)^2}{\left(1-a^2x^2\right)^{5/2}}\,dx}{4c^3} + \frac{3\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^2}\,dx}{4c}$$

$$= -\frac{\sin^{-1}(ax)^2}{4ac^3\left(1-a^2x^2\right)^{3/2}} + \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} + \frac{3x\sin^{-1}(ax)^3}{8c^3\left(1-a^2x^2\right)} + \frac{\int \frac{\sin^{-1}(ax)}{\left(1-a^2x^2\right)^2}\,dx}{2c^3} - \frac{(9a)\int \frac{x\sin^{-1}(ax)^2}{\left(1-a^2x^2\right)^{3/2}}\,dx}{8c^3} +$$

$$= \frac{x\sin^{-1}(ax)}{4c^3\left(1-a^2x^2\right)} - \frac{\sin^{-1}(ax)^2}{4ac^3\left(1-a^2x^2\right)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} + \frac{3x\sin^{-1}(ax)^3}{8c^3\left(1-a^2x^2\right)} + \int \frac{\sin}{1-}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3\left(1-a^2x^2\right)} - \frac{\sin^{-1}(ax)^2}{4ac^3\left(1-a^2x^2\right)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} + \frac{3x}{8c^3}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3\left(1-a^2x^2\right)} - \frac{\sin^{-1}(ax)^2}{4ac^3\left(1-a^2x^2\right)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} + \frac{3x}{8c^3}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3\left(1-a^2x^2\right)} - \frac{\sin^{-1}(ax)^2}{4ac^3\left(1-a^2x^2\right)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} + \frac{3x}{8c^3}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3\left(1-a^2x^2\right)} - \frac{\sin^{-1}(ax)^2}{4ac^3\left(1-a^2x^2\right)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} + \frac{3x}{8c^3}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3\left(1-a^2x^2\right)} - \frac{\sin^{-1}(ax)^2}{4ac^3\left(1-a^2x^2\right)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{4c^3\left(1-a^2x^2\right)^2} + \frac{3x}{8c^3}$$

Mathematica [B] time = 12.4414, size = 1544, normalized size = 3.39

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^3,x]
```

```
[Out] -(((1 + 5*ArcSin[a*x]^2)/4 - (5*(ArcSin[a*x]*(Log[1 - I*E^(I*ArcSin[a*x])]
- Log[1 + I*E^(I*ArcSin[a*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcSin[a*x])] - P
olyLog[2, I*E^(I*ArcSin[a*x])])))/2 - (3*((Pi^3*Log[Cot[(Pi/2 - ArcSin[a*x]
)/2]])/8 + (3*Pi^2*((Pi/2 - ArcSin[a*x])*(Log[1 - E^(I*(Pi/2 - ArcSin[a*x])
```

```
)] - Log[1 + E^(I*(Pi/2 - ArcSin[a*x]))]) + I*(PolyLog[2, -E^(I*(Pi/2 - Arc
Sin[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcSin[a*x]))])))/4 - (3*Pi*((Pi/2 -
ArcSin[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcSin[a*x]))] - Log[1 + E^(I*(Pi/2 -
ArcSin[a*x]))]) + (2*I)*(Pi/2 - ArcSin[a*x])*(PolyLog[2, -E^(I*(Pi/2 - ArcS
in[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcSin[a*x]))]) + 2*(-PolyLog[3, -E^(I
*(Pi/2 - ArcSin[a*x]))] + PolyLog[3, E^(I*(Pi/2 - ArcSin[a*x]))])))/2 + 8*(
(I/64)*(Pi/2 - ArcSin[a*x])^4 + (I/4)*(Pi/2 + (-Pi/2 + ArcSin[a*x])/2)^4 -
((Pi/2 - ArcSin[a*x])^3*Log[1 + E^(I*(Pi/2 - ArcSin[a*x]))])/8 - (Pi^3*(I*(
Pi/2 + (-Pi/2 + ArcSin[a*x])/2) - Log[1 + E^((2*I)*(Pi/2 + (-Pi/2 + ArcSin[
a*x])/2))]))/8 - (Pi/2 + (-Pi/2 + ArcSin[a*x])/2)^3*Log[1 + E^((2*I)*(Pi/2
+ (-Pi/2 + ArcSin[a*x])/2))] + ((3*I)/8)*(Pi/2 - ArcSin[a*x])^2*PolyLog[2,
-E^(I*(Pi/2 - ArcSin[a*x]))] + (3*Pi^2*((I/2)*(Pi/2 + (-Pi/2 + ArcSin[a*x])
/2)^2 - (Pi/2 + (-Pi/2 + ArcSin[a*x])/2)*Log[1 + E^((2*I)*(Pi/2 + (-Pi/2 +
ArcSin[a*x])/2))] + (I/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-Pi/2 + ArcSin[a*x]
)/2))]))/4 + ((3*I)/2)*(Pi/2 + (-Pi/2 + ArcSin[a*x])/2)^2*PolyLog[2, -E^((2
*I)*(Pi/2 + (-Pi/2 + ArcSin[a*x])/2))] - (3*(Pi/2 - ArcSin[a*x])*PolyLog[3,
 -E^(I*(Pi/2 - ArcSin[a*x]))])/4 - (3*Pi*((I/3)*(Pi/2 + (-Pi/2 + ArcSin[a*x
])/2)^3 - (Pi/2 + (-Pi/2 + ArcSin[a*x])/2)^2*Log[1 + E^((2*I)*(Pi/2 + (-Pi/
2 + ArcSin[a*x])/2))] + I*(Pi/2 + (-Pi/2 + ArcSin[a*x])/2)*PolyLog[2, -E^((
2*I)*(Pi/2 + (-Pi/2 + ArcSin[a*x])/2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-Pi
/2 + ArcSin[a*x])/2))]/2))/2 - (3*(Pi/2 + (-Pi/2 + ArcSin[a*x])/2)*PolyLog[
3, -E^((2*I)*(Pi/2 + (-Pi/2 + ArcSin[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -
E^(I*(Pi/2 - ArcSin[a*x]))] - ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-Pi/2
 + ArcSin[a*x])/2))])))/8 - ArcSin[a*x]^3/(16*(Cos[ArcSin[a*x]/2] - Sin[Arc
Sin[a*x]/2])^4) - (2*ArcSin[a*x] - ArcSin[a*x]^2 + 3*ArcSin[a*x]^3)/(16*(Co
s[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/2])^2) + (ArcSin[a*x]^2*Sin[ArcSin[a*x]/
2])/(8*(Cos[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/2])^3) + ArcSin[a*x]^3/(16*(Co
s[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/2])^4) - (ArcSin[a*x]^2*Sin[ArcSin[a*x]/
2])/(8*(Cos[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/2])^3) - (-2*ArcSin[a*x] - Arc
Sin[a*x]^2 - 3*ArcSin[a*x]^3)/(16*(Cos[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/2])
^2) - (-Sin[ArcSin[a*x]/2] - 5*ArcSin[a*x]^2*Sin[ArcSin[a*x]/2])/(4*(Cos[Ar
cSin[a*x]/2] - Sin[ArcSin[a*x]/2])) - (Sin[ArcSin[a*x]/2] + 5*ArcSin[a*x]^2
*Sin[ArcSin[a*x]/2])/(4*(Cos[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/2])))/(a*c^3)
)
```

Maple [A] time = 0.224, size = 726, normalized size = 1.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x)
```

```
[Out] -3/8*a^2/(a^4*x^4-2*a^2*x^2+1)/c^3*arcsin(a*x)^3*x^3+9/8*a/(a^4*x^4-2*a^2*x
^2+1)/c^3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*x^2-1/4*a^2/(a^4*x^4-2*a^2*x^2+1
)/c^3*arcsin(a*x)*x^3+1/4*a/(a^4*x^4-2*a^2*x^2+1)/c^3*x^2*(-a^2*x^2+1)^(1/2
)+5/8/(a^4*x^4-2*a^2*x^2+1)/c^3*arcsin(a*x)^3*x-11/8/a/(a^4*x^4-2*a^2*x^2+1
)/c^3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)+1/4/(a^4*x^4-2*a^2*x^2+1)/c^3*arcsin
(a*x)*x-1/4/a/(a^4*x^4-2*a^2*x^2+1)/c^3*(-a^2*x^2+1)^(1/2)-3/8/a/c^3*arcsin
(a*x)^3*ln(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))+5/2*I/a/c^3*dilog(1+I*(I*a*x+(-a
^2*x^2+1)^(1/2)))-9/4*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/
a/c^3+9/4*I*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3+3/8/a/c^3*arcsin(
a*x)^3*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-5/2*I/a/c^3*dilog(1-I*(I*a*x+(-a^
2*x^2+1)^(1/2)))+9/4*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/
c^3-9/4*I*polylog(4,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3-5/2/a/c^3*arcsin(a
*x)*ln(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))+5/2/a/c^3*arcsin(a*x)*ln(1-I*(I*a*x+
(-a^2*x^2+1)^(1/2)))+9/8*I*arcsin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(
```

```
1/2)))/a/c^3-9/8*I*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/
c^3
```

Maxima [A] time = 3.31889, size = 105, normalized size = 0.23

$$-\frac{1}{16}\left(\frac{2\left(3\,a^2x^3-5\,x\right)}{a^4c^3x^4-2\,a^2c^3x^2+c^3}-\frac{3\,\log\left(ax+1\right)}{ac^3}+\frac{3\,\log\left(ax-1\right)}{ac^3}\right)\arcsin\left(ax\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] -1/16*(2*(3*a^2*x^3 - 5*x)/(a^4*c^3*x^4 - 2*a^2*c^3*x^2 + c^3) - 3*log(a*x
+ 1)/(a*c^3) + 3*log(a*x - 1)/(a*c^3))*arcsin(a*x)^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\arcsin\left(ax\right)^3}{a^6c^3x^6-3\,a^4c^3x^4+3\,a^2c^3x^2-c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(-arcsin(a*x)^3/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{\operatorname{asin}^{3}{\left(ax \right)}}{a^{6}x^{6}-3a^{4}x^{4}+3a^{2}x^{2}-1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**3,x)
```

```
[Out] -Integral(asin(a*x)**3/(a**6*x**6 - 3*a**4*x**4 + 3*a**2*x**2 - 1), x)/c**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\arcsin\left(ax\right)^3}{\left(a^2cx^2-c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] integrate(-arcsin(a*x)^3/(a^2*c*x^2 - c)^3, x)
```

3.295 $\int \left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^3\,dx$

Optimal. Leaf size=533

$$-\frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}+\frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{15ac^2x^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{32\sqrt{1-a^2x^2}}+\frac{5}{16}c^2x\sqrt{c-}$$

```
[Out] (865*a*c^2*x^2*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (65*a^3*c^2*
x^4*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (c^2*(1 - a^2*x^2)^(5/2
)*Sqrt[c - a^2*c*x^2])/(216*a) - (245*c^2*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]
)/384 - (65*c^2*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/576 - (c^2
*x*(1 - a^2*x^2)^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/36 + (115*c^2*Sqrt[c -
a^2*c*x^2]*ArcSin[a*x]^2)/(768*a*Sqrt[1 - a^2*x^2]) - (15*a*c^2*x^2*Sqrt[c
- a^2*c*x^2]*ArcSin[a*x]^2)/(32*Sqrt[1 - a^2*x^2]) + (5*c^2*(1 - a^2*x^2)^(
3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(32*a) + (c^2*(1 - a^2*x^2)^(5/2)*S
qrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(12*a) + (5*c^2*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x]^3)/16 + (5*c*x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/24 + (x*(c - a
^2*c*x^2)^(5/2)*ArcSin[a*x]^3)/6 + (5*c^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4
)/(64*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.547163, antiderivative size = 533, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4649, 4647, 4641, 4627, 4707, 30, 4677, 14, 261}

$$-\frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}+\frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{15ac^2x^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{32\sqrt{1-a^2x^2}}+\frac{5}{16}c^2x\sqrt{c-}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^3,x]
```



```
[Out] (865*a*c^2*x^2*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (65*a^3*c^2*
x^4*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (c^2*(1 - a^2*x^2)^(5/2
)*Sqrt[c - a^2*c*x^2])/(216*a) - (245*c^2*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]
)/384 - (65*c^2*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/576 - (c^2
*x*(1 - a^2*x^2)^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/36 + (115*c^2*Sqrt[c -
a^2*c*x^2]*ArcSin[a*x]^2)/(768*a*Sqrt[1 - a^2*x^2]) - (15*a*c^2*x^2*Sqrt[c
- a^2*c*x^2]*ArcSin[a*x]^2)/(32*Sqrt[1 - a^2*x^2]) + (5*c^2*(1 - a^2*x^2)^(
3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(32*a) + (c^2*(1 - a^2*x^2)^(5/2)*S
qrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(12*a) + (5*c^2*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x]^3)/16 + (5*c*x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/24 + (x*(c - a
^2*c*x^2)^(5/2)*ArcSin[a*x]^3)/6 + (5*c^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4
)/(64*a*Sqrt[1 - a^2*x^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^3\,dx = \frac{1}{6}x\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^3+\frac{1}{6}(5c)\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3\,dx-\frac{\left(ac^2\sqrt{c-a^2cx^2}\right)\int}{2}$$

$$=\frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{12a}+\frac{5}{24}cx\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3+\frac{1}{6}x\left(c-a^2cx^2\right)$$

$$=-\frac{1}{36}c^2x\left(1-a^2x^2\right)^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)+\frac{5c^2\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{32a}+\frac{c^2}{}$$

$$=-\frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{65}{576}c^2x\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sin^{-1}(ax)-\frac{1}{36}c^2x\left(1-a^2x\right.$$

$$=-\frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{245}{384}c^2x\sqrt{c-a^2cx^2}\sin^{-1}(ax)-\frac{65}{576}c^2x\left(1-a^2x^2\right)\sqrt{c-a}$$

$$=\frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{245}{384}c^2x\sqrt{c-}$$

Mathematica [A] time = 0.800163, size = 179, normalized size = 0.34

$$\frac{c^2\sqrt{c-a^2cx^2}\left(4320\sin^{-1}(ax)^4+288\left(45\sin\left(2\sin^{-1}(ax)\right)+9\sin\left(4\sin^{-1}(ax)\right)+\sin\left(6\sin^{-1}(ax)\right)\right)\sin^{-1}(ax)^3-12\left(162\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^3,x]
```

```
[Out] (c^2*Sqrt[c - a^2*c*x^2]*(4320*ArcSin[a*x]^4 - 9720*Cos[2*ArcSin[a*x]] - 24
3*Cos[4*ArcSin[a*x]] - 8*Cos[6*ArcSin[a*x]] + 72*ArcSin[a*x]^2*(270*Cos[2*A
rcSin[a*x]] + 27*Cos[4*ArcSin[a*x]] + 2*Cos[6*ArcSin[a*x]]) + 288*ArcSin[a*
x]^3*(45*Sin[2*ArcSin[a*x]] + 9*Sin[4*ArcSin[a*x]] + Sin[6*ArcSin[a*x]]) -
12*ArcSin[a*x]*(1620*Sin[2*ArcSin[a*x]] + 81*Sin[4*ArcSin[a*x]] + 4*Sin[6*A
rcSin[a*x]])))/(55296*a*Sqrt[1 - a^2*x^2])
```

Maple [C] time = 0.247, size = 875, normalized size = 1.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x)
```

```
[Out] -5/64*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4
*c^2+1/13824*(-c*(a^2*x^2-1))^(1/2)*(-32*I*(-a^2*x^2+1)^(1/2)*x^6*a^6+32*x^
7*a^7+48*I*(-a^2*x^2+1)^(1/2)*x^4*a^4-64*a^5*x^5-18*I*(-a^2*x^2+1)^(1/2)*x^
2*a^2+38*a^3*x^3+I*(-a^2*x^2+1)^(1/2)-6*a*x)*(18*I*arcsin(a*x)^2+36*arcsin(
a*x)^3-I-6*arcsin(a*x))*c^2/a/(a^2*x^2-1)-3/4096*(-c*(a^2*x^2-1))^(1/2)*(-8
*I*(-a^2*x^2+1)^(1/2)*x^4*a^4+8*a^5*x^5+8*I*(-a^2*x^2+1)^(1/2)*x^2*a^2-12*a
^3*x^3-I*(-a^2*x^2+1)^(1/2)+4*a*x)*(24*I*arcsin(a*x)^2+32*arcsin(a*x)^3-3*I
-12*arcsin(a*x))*c^2/a/(a^2*x^2-1)+15/512*(-c*(a^2*x^2-1))^(1/2)*(-2*I*(-a^
2*x^2+1)^(1/2)*x^2*a^2+2*a^3*x^3+I*(-a^2*x^2+1)^(1/2)-2*a*x)*(6*I*arcsin(a*
x)^2+4*arcsin(a*x)^3-3*I-6*arcsin(a*x))*c^2/a/(a^2*x^2-1)+15/512*(-c*(a^2*x
```

```
^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+2*a^3*x^3-I*(-a^2*x^2+1)^(1/2)
-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3+3*I-6*arcsin(a*x))*c^2/a/(a^2*x
^2-1)-3/4096*(-c*(a^2*x^2-1))^(1/2)*(8*I*(-a^2*x^2+1)^(1/2)*x^4*a^4+8*a^5*x
^5-8*I*(-a^2*x^2+1)^(1/2)*x^2*a^2-12*a^3*x^3+I*(-a^2*x^2+1)^(1/2)+4*a*x)*(-
24*I*arcsin(a*x)^2+32*arcsin(a*x)^3+3*I-12*arcsin(a*x))*c^2/a/(a^2*x^2-1)+1
/13824*(-c*(a^2*x^2-1))^(1/2)*(32*I*(-a^2*x^2+1)^(1/2)*x^6*a^6+32*x^7*a^7-4
8*I*(-a^2*x^2+1)^(1/2)*x^4*a^4-64*a^5*x^5+18*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+3
8*a^3*x^3-I*(-a^2*x^2+1)^(1/2)-6*a*x)*(-18*I*arcsin(a*x)^2+36*arcsin(a*x)^3
+I-6*arcsin(a*x))*c^2/a/(a^2*x^2-1)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(a^4c^2x^4 - 2\,a^2c^2x^2 + c^2\right)\sqrt{-a^2cx^2 + c}\,\arcsin\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="fricas")

[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*sqrt(-a^2*c*x^2 + c)*arcsin(a*
x)^3, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(5/2)*asin(a*x)**3,x)

[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-a^2cx^2 + c\right)^{\frac{5}{2}} \arcsin\left(ax\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="giac")

[Out] integrate((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^3, x)
```

3.296 $\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3\,dx$

Optimal. Leaf size=365

$$-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}+\frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{16\sqrt{1-a^2x^2}}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3+\frac{3}{8}cx\sqrt{c-a^2cx^2}\ldots$$

```
[Out] (51*a*c*x^2*Sqrt[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (3*a^3*c*x^4*Sqr
t[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (45*c*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x])/64 - (3*c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/32 + (
27*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(128*a*Sqrt[1 - a^2*x^2]) - (9*a*c*
x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*Sqrt[1 - a^2*x^2]) + (3*c*(1 - a
^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*a) + (3*c*x*Sqrt[c - a
^2*c*x^2]*ArcSin[a*x]^3)/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/4 + (3
*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4)/(32*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.322146, antiderivative size = 365, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4649, 4647, 4641, 4627, 4707, 30, 4677, 14}

$$-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}+\frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{16\sqrt{1-a^2x^2}}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3+\frac{3}{8}cx\sqrt{c-a^2cx^2}\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3,x]
```


```
[Out] (51*a*c*x^2*Sqrt[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (3*a^3*c*x^4*Sqr
t[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (45*c*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x])/64 - (3*c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/32 + (
27*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(128*a*Sqrt[1 - a^2*x^2]) - (9*a*c*
x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*Sqrt[1 - a^2*x^2]) + (3*c*(1 - a
^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*a) + (3*c*x*Sqrt[c - a
^2*c*x^2]*ArcSin[a*x]^3)/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/4 + (3
*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4)/(32*a*Sqrt[1 - a^2*x^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3\,dx = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3+\frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^3\,dx-\frac{\left(3ac\sqrt{c-a^2cx^2}\right)\int x$$

$$=\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{16a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\sin^{-1}(ax)^3+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}$$

$$=-\frac{3}{32}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sin^{-1}(ax)-\frac{9acx^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{16\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}}{}$$

$$=-\frac{45}{64}cx\sqrt{c-a^2cx^2}\sin^{-1}(ax)-\frac{3}{32}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sin^{-1}(ax)-\frac{9acx^2\sqrt{c-a^2cx^2}}{16\sqrt{1-a^2}}$$

$$=\frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{45}{64}cx\sqrt{c-a^2cx^2}\sin^{-1}(ax)-\frac{3}{32}cx\left(1-a^2x^2\right)$$

Mathematica [A] time = 0.313282, size = 138, normalized size = 0.38

$$\frac{c\sqrt{c-a^2cx^2}\left(96\sin^{-1}(ax)^4+32\left(8\sin\left(2\sin^{-1}(ax)\right)+\sin\left(4\sin^{-1}(ax)\right)\right)\sin^{-1}(ax)^3-12\left(32\sin\left(2\sin^{-1}(ax)\right)+\sin\left(4\sin\right.\right.\right.}{1024a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3,x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(96*ArcSin[a*x]^4 + 24*ArcSin[a*x]^2*(16*Cos[2*ArcSi
n[a*x]] + Cos[4*ArcSin[a*x]]) - 3*(64*Cos[2*ArcSin[a*x]] + Cos[4*ArcSin[a*x
]]) + 32*ArcSin[a*x]^3*(8*Sin[2*ArcSin[a*x]] + Sin[4*ArcSin[a*x]]) - 12*Arc
Sin[a*x]*(32*Sin[2*ArcSin[a*x]] + Sin[4*ArcSin[a*x]])))/(1024*a*Sqrt[1 - a^
2*x^2])
```

Maple [C] time = 0.161, size = 533, normalized size = 1.5

$$-\frac{3\,(\arcsin(ax))^4c}{32\,a\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}-\frac{\left(24\,i\,(\arcsin(ax))^2+32\,(\arcsin(ax))^3-3\,i-12\,\arcsin(ax)\right)c}{2048\,a\left(a^2x^2-1\right)}\sqrt{-c\left(a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x)
```

```
[Out] -3/32*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4
*c-1/2048*(-c*(a^2*x^2-1))^(1/2)*(-8*I*(-a^2*x^2+1)^(1/2)*x^4*a^4+8*a^5*x^5
+8*I*(-a^2*x^2+1)^(1/2)*x^2*a^2-12*a^3*x^3-I*(-a^2*x^2+1)^(1/2)+4*a*x)*(24*
I*arcsin(a*x)^2+32*arcsin(a*x)^3-3*I-12*arcsin(a*x))*c/a/(a^2*x^2-1)+1/32*(
-c*(a^2*x^2-1))^(1/2)*(-2*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+2*a^3*x^3+I*(-a^2*x^
2+1)^(1/2)-2*a*x)*(6*I*arcsin(a*x)^2+4*arcsin(a*x)^3-3*I-6*arcsin(a*x))*c/a
/(a^2*x^2-1)+1/32*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+2*
a^3*x^3-I*(-a^2*x^2+1)^(1/2)-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3+3*I
-6*arcsin(a*x))*c/a/(a^2*x^2-1)-1/2048*(-c*(a^2*x^2-1))^(1/2)*(8*I*(-a^2*x^
2+1)^(1/2)*x^4*a^4+8*a^5*x^5-8*I*(-a^2*x^2+1)^(1/2)*x^2*a^2-12*a^3*x^3+I*(-
a^2*x^2+1)^(1/2)+4*a*x)*(-24*I*arcsin(a*x)^2+32*arcsin(a*x)^3+3*I-12*arcsin
(a*x))*c/a/(a^2*x^2-1)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(a^2cx^2-c\right)\sqrt{-a^2cx^2+c}\arcsin\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c*x^2 - c)*sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\left(-a^2cx^2+c\right)^{\frac{3}{2}}\arcsin\left(ax\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^3, x)
```

3.297 $\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^3\,dx$

Optimal. Leaf size=215

$$\frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^4}{8a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^3-\frac{3ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{4\sqrt{1-a^2x^2}}+\frac{3\sqrt{c-a^2cx^2}\sin^{-1}(}{8a\sqrt{1-a^2x^2}}$$

```
[Out] (3*a*x^2*Sqrt[c - a^2*c*x^2])/(8*Sqrt[1 - a^2*x^2]) - (3*x*Sqrt[c - a^2*c*x
^2]*ArcSin[a*x])/4 + (3*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(8*a*Sqrt[1 - a^
2*x^2]) - (3*a*x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(4*Sqrt[1 - a^2*x^2])
 + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3)/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*
x]^4)/(8*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.164842, antiderivative size = 215, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4647, 4641, 4627, 4707, 30}

$$\frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^4}{8a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^3-\frac{3ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{4\sqrt{1-a^2x^2}}+\frac{3\sqrt{c-a^2cx^2}\sin^{-1}(}{8a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3,x]
```

```
[Out] (3*a*x^2*Sqrt[c - a^2*c*x^2])/(8*Sqrt[1 - a^2*x^2]) - (3*x*Sqrt[c - a^2*c*x
^2]*ArcSin[a*x])/4 + (3*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(8*a*Sqrt[1 - a^
2*x^2]) - (3*a*x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(4*Sqrt[1 - a^2*x^2])
 + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3)/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*
x]^4)/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
```

```
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^3\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^3 + \frac{\sqrt{c-a^2cx^2}\int\frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} - \frac{\left(3a\sqrt{c-a^2cx^2}\right)\int x\sin^{-1}(ax)^2\,}{2\sqrt{1-a^2x^2}}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{4\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^3 + \frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^4}{8a\sqrt{1-a^2x^2}} + \frac{(3}{}$$

$$= -\frac{3}{4}x\sqrt{c-a^2cx^2}\sin^{-1}(ax) - \frac{3ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{4\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^3 + $$

$$= \frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}} - \frac{3}{4}x\sqrt{c-a^2cx^2}\sin^{-1}(ax) + \frac{3\sqrt{c-a^2cx^2}\sin^{-1}(ax)^2}{8a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}}{4\sqrt{1-}}$$

Mathematica [A] time = 0.0573778, size = 114, normalized size = 0.53

$$\frac{\sqrt{c-a^2cx^2}\left(3a^2x^2+4ax\sqrt{1-a^2x^2}\sin^{-1}(ax)^3+\left(3-6a^2x^2\right)\sin^{-1}(ax)^2-6ax\sqrt{1-a^2x^2}\sin^{-1}(ax)+\sin^{-1}(ax)^4\right)}{8a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3,x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*(3*a^2*x^2 - 6*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + (3
- 6*a^2*x^2)*ArcSin[a*x]^2 + 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + ArcSin
[a*x]^4))/(8*a*Sqrt[1 - a^2*x^2])
```

Maple [C] time = 0.139, size = 260, normalized size = 1.2

$$-\frac{(\arcsin(ax))^4}{8a\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}+\frac{6i(\arcsin(ax))^2+4(\arcsin(ax))^3-3i-6\arcsin(ax)}{32a\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x)
```

```
[Out] -1/8*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4+
1/32*(-c*(a^2*x^2-1))^(1/2)*(-2*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+2*a^3*x^3+I*(-
a^2*x^2+1)^(1/2)-2*a*x)*(6*I*arcsin(a*x)^2+4*arcsin(a*x)^3-3*I-6*arcsin(a*x
))/a/(a^2*x^2-1)+1/32*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*x^2*a^
2+2*a^3*x^3-I*(-a^2*x^2+1)^(1/2)-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3
```

```
+3*I-6*arcsin(a*x))/a/(a^2*x^2-1)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-a^2cx^2+c}\arcsin\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{-c\left(ax-1\right)\left(ax+1\right)}\operatorname{asin}^3\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**3,x)
```

```
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{-a^2cx^2+c}\arcsin\left(ax\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)
```

3.298 $\int \frac{\sin^{-1}(ax)^3}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=42

$$\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^4)/(4*a*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0687473, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4643, 4641}

$$\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^4)/(4*a*Sqrt[c - a^2*c*x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^3}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^4}{4a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.0434918, size = 42, normalized size = 1.

$$\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^4)/(4*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.03, size = 52, normalized size = 1.2

$$-\frac{(\arcsin(ax))^4}{4\,ca\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -1/4*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c/(a^2*x^2-1)*arcsin(a*x)^
4
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)^3}{a^2cx^2-c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^3(ax)}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**3/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin (ax)^3}{\sqrt{-a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/sqrt(-a^2*c*x^2 + c), x)
```

3.299 $\int \frac{\sin^{-1}(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=238

$$-\frac{3i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}+\frac{3\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)}{2ac\sqrt{c-a^2cx^2}}+\frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin}{ac\sqrt{c-a}}$$

```
[Out] (x*ArcSin[a*x]^3)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^3)/(a*c*Sqrt[c - a^2*c*x^2]) + (3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 +
 E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - ((3*I)*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]
) + (3*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x])])/(2*a*c*Sqrt[c
- a^2*c*x^2])
```

Rubi [A] time = 0.174875, antiderivative size = 238, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4653, 4675, 3719, 2190, 2531, 2282, 6589}

$$-\frac{3i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}+\frac{3\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)}{2ac\sqrt{c-a^2cx^2}}+\frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\sin}{ac\sqrt{c-a}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^3)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^3)/(a*c*Sqrt[c - a^2*c*x^2]) + (3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 +
 E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - ((3*I)*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]
) + (3*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x])])/(2*a*c*Sqrt[c
- a^2*c*x^2])
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{3/2}}\,dx = \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{\left(3a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)^2}{1-a^2x^2}\,dx}{c\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{\left(3\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int x^2\tan(x)\,dx, x, \sin^{-1}(ax)\right)}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{\left(6i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}x^2}{1+e^{2ix}}\,dx, x, \sin^{-1}(ax)\right)}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}} - \frac{\left(6\sqrt{1-a\right.}{}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}} - \frac{3i\sqrt{1-a}{}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}} - \frac{3i\sqrt{1-a}{}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(ax)}\right)}{ac\sqrt{c-a^2cx^2}} - \frac{3i\sqrt{1-a}{}$$

Mathematica [A] time = 0.251727, size = 157, normalized size = 0.66

$$\frac{-6i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)+3\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)+2\sin^{-1}(ax)^2\left(\left(ax-i\sqrt{1-a^2x\right.\right.}{2ac\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (2*ArcSin[a*x]^2*((a*x - I*Sqrt[1 - a^2*x^2])*ArcSin[a*x] + 3*Sqrt[1 - a^2*
x^2]*Log[1 + E^((2*I)*ArcSin[a*x])]) - (6*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*
PolyLog[2, -E^((2*I)*ArcSin[a*x])] + 3*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*
I)*ArcSin[a*x])])/(2*a*c*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.101, size = 203, normalized size = 0.9

$$-\frac{(\arcsin(ax))^3}{c^2a\left(a^2x^2-1\right)}\sqrt{-c\left(a^2x^2-1\right)}\left(i\sqrt{-a^2x^2+1}+ax\right)+\frac{1}{2c^2a\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}\sqrt{-c\left(a^2x^2-1\right)}\left(4i(\arcsin(ax))^3+6i\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)+a*x)*arcsin(a*x)^3/a/c^2/(a^2
*x^2-1)+1/2*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(4*I*arcsin(a*x)^3+6*
I*arcsin(a*x)*polylog(2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-6*arcsin(a*x)^2*ln(1
+(I*a*x+(-a^2*x^2+1)^(1/2))^2)-3*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/
a/c^2/(a^2*x^2-1)
```

Maxima [A] time = 4.00156, size = 76, normalized size = 0.32

$$-\frac{3a\sqrt{\frac{1}{a^4c}}\arcsin(ax)^2\log\left(x^2-\frac{1}{a^2}\right)}{2c}+\frac{x\arcsin(ax)^3}{\sqrt{-a^2cx^2+cc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] -3/2*a*sqrt(1/(a^4*c))*arcsin(a*x)^2*log(x^2 - 1/a^2)/c + x*arcsin(a*x)^3/(
sqrt(-a^2*c*x^2 + c)*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)^3}{a^4c^2x^4-2a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 +
c^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^3(ax)}{(-c(ax-1)(ax+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(3/2), x)
```

3.300 $\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=388

$$-\frac{2i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}}+\frac{2}{3}$$

```
[Out] (x*ArcSin[a*x])/(c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]^2/(2*a*c^2*Sqrt[1 -
 a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]^3)/(3*c*(c - a^2*c*x^2)^(3/
2)) + (2*x*ArcSin[a*x]^3)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]^3)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*x^2])
+ (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^2*Sqrt[c - a^2*c*x^2]) - ((2*
I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2
*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x]
)])/(a*c^2*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.305563, antiderivative size = 388, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4655, 4653, 4675, 3719, 2190, 2531, 2282, 6589, 4677, 4651, 260}

$$-\frac{2i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}}+\frac{2}{3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(5/2),x]
```


```
[Out] (x*ArcSin[a*x])/(c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]^2/(2*a*c^2*Sqrt[1 -
 a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]^3)/(3*c*(c - a^2*c*x^2)^(3/
2)) + (2*x*ArcSin[a*x]^3)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]^3)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*x^2])
+ (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^2*Sqrt[c - a^2*c*x^2]) - ((2*
I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2
*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x]
)])/(a*c^2*Sqrt[c - a^2*c*x^2])
```


Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
```

```
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
```

```
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{5/2}}\,dx = \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{3c} - \frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)^2}{\left(1-a^2x^2\right)^2}\,dx}{c^2\sqrt{c-a^2cx^2}}$$

$$= -\frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)}{\left(1-a^2x^2\right)^{3/2}}\,dx}{c^2\sqrt{c-a^2cx^2}} - \frac{(2$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{\left(2\sqrt{1-a^2x^2}\right)\mathrm{S}}{}$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\sin}{3ac^2\sqrt{c-a^2}}$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\sin}{3ac^2\sqrt{c-a^2}}$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\sin}{3ac^2\sqrt{c-a^2}}$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\sin}{3ac^2\sqrt{c-a^2}}$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\sin}{3ac^2\sqrt{c-a^2}}$$

Mathematica [A] time = 0.558723, size = 211, normalized size = 0.54

$$\frac{\left(1-a^2x^2\right)^{3/2}\left(-12i\sin^{-1}(ax)\mathrm{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)+6\mathrm{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)+3\log\left(1-a^2x^2\right)+\frac{4ax\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}+2}{6ac\left(c-a^2cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] ((1 - a^2*x^2)^(3/2)*((6*a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2] + (3*ArcSin[a*x
]^2)/(-1 + a^2*x^2) - (4*I)*ArcSin[a*x]^3 + (2*a*x*ArcSin[a*x]^3)/(1 - a^2*
x^2)^(3/2) + (4*a*x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2] + 12*ArcSin[a*x]^2*Log
[1 + E^((2*I)*ArcSin[a*x])] + 3*Log[1 - a^2*x^2] - (12*I)*ArcSin[a*x]*PolyL
og[2, -E^((2*I)*ArcSin[a*x])] + 6*PolyLog[3, -E^((2*I)*ArcSin[a*x])]))/(6*a
*c*(c - a^2*c*x^2)^(3/2))
```

Maple [A] time = 0.207, size = 661, normalized size = 1.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/6*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+2*a^3*x^3-2*I*(
-a^2*x^2+1)^(1/2)-3*a*x)*arcsin(a*x)*(-6*I*arcsin(a*x)*x^4*a^4-6*arcsin(a*x
)*(-a^2*x^2+1)^(1/2)*x^3*a^3+6*I*(-a^2*x^2+1)^(1/2)*x^3*a^3-6*a^4*x^4+6*arc
sin(a*x)^2*x^2*a^2+12*I*arcsin(a*x)*x^2*a^2+9*arcsin(a*x)*(-a^2*x^2+1)^(1/2
)*x*a-6*I*(-a^2*x^2+1)^(1/2)*x*a+18*a^2*x^2-8*arcsin(a*x)^2-6*I*arcsin(a*x)
-12)/c^3/(3*a^6*x^6-10*a^4*x^4+11*a^2*x^2-4)/a-(-c*(a^2*x^2-1))^(1/2)*(-a^2
*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*(-c*(a
^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*ln(I*a*x+(-a^2*x^2+1)
^(1/2))+4/3*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)/a/c^3/(a^2*x^2-1)*a
rcsin(a*x)^3-2*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*
arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*I*(-a^2*x^2+1)^(1/2)*(-c
*(a^2*x^2-1))^(1/2)/a/c^3/(a^2*x^2-1)*arcsin(a*x)*polylog(2,-(I*a*x+(-a^2*x
^2+1)^(1/2))^2)-(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)
*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)
```

Maxima [A] time = 2.70521, size = 143, normalized size = 0.37

$$\frac{1}{2}\,a\left(\frac{1}{a^4c^{\frac{5}{2}}x^2-a^2c^{\frac{5}{2}}}+\frac{2\,\log\left(ax+1\right)}{a^2c^{\frac{5}{2}}}+\frac{2\,\log\left(ax-1\right)}{a^2c^{\frac{5}{2}}}\right)\arcsin\left(ax\right)^2+\frac{1}{3}\left(\frac{2\,x}{\sqrt{-a^2cx^2+cc^2}}+\frac{x}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}c}\right)\arcsin\left(a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/2*a*(1/(a^4*c^(5/2)*x^2 - a^2*c^(5/2)) + 2*log(a*x + 1)/(a^2*c^(5/2)) + 2
*log(a*x - 1)/(a^2*c^(5/2)))*arcsin(a*x)^2 + 1/3*(2*x/(sqrt(-a^2*c*x^2 + c)
*c^2) + x/((-a^2*c*x^2 + c)^(3/2)*c))*arcsin(a*x)^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2cx^2+c}\arcsin\left(ax\right)^3}{a^6c^3x^6-3\,a^4c^3x^4+3\,a^2c^3x^2-c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 +
 3*a^2*c^3*x^2 - c^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^3(ax)}{(-c(ax-1)(ax+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\left(-a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(5/2), x)
```

3.301 $\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{7/2}}\,dx$

Optimal. Leaf size=547

$$-\frac{8i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}+\frac{4\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}-\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2c}}$$

```
[Out] -1/(20*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(c^3*
Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(10*c^3*(1 - a^2*x^2)*Sqrt[c - a^2*c
*x^2]) - (3*ArcSin[a*x]^2)/(20*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2
]) - (2*ArcSin[a*x]^2)/(5*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x
*ArcSin[a*x]^3)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^3)/(15*c^2*(
c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x]^3)/(15*c^3*Sqrt[c - a^2*c*x^2]) -
(((8*I)/15)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(a*c^3*Sqrt[c - a^2*c*x^2]) +
(8*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(5*a*c^3
*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^3*Sqrt[
c - a^2*c*x^2]) - (((8*I)/5)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^((
2*I)*ArcSin[a*x])])/(a*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Poly
Log[3, -E^((2*I)*ArcSin[a*x])])/(5*a*c^3*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.48107, antiderivative size = 547, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4655, 4653, 4675, 3719, 2190, 2531, 2282, 6589, 4677, 4651, 260, 261}

$$-\frac{8i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}+\frac{4\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}-\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -1/(20*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(c^3*
Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(10*c^3*(1 - a^2*x^2)*Sqrt[c - a^2*c
*x^2]) - (3*ArcSin[a*x]^2)/(20*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2
]) - (2*ArcSin[a*x]^2)/(5*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x
*ArcSin[a*x]^3)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^3)/(15*c^2*(
c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x]^3)/(15*c^3*Sqrt[c - a^2*c*x^2]) -
(((8*I)/15)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(a*c^3*Sqrt[c - a^2*c*x^2]) +
(8*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(5*a*c^3
*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^3*Sqrt[
c - a^2*c*x^2]) - (((8*I)/5)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^((
2*I)*ArcSin[a*x])])/(a*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Poly
Log[3, -E^((2*I)*ArcSin[a*x])])/(5*a*c^3*Sqrt[c - a^2*c*x^2])
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

```
&& GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4653

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n*Sqrt[1 - c^2*x^2])/(d*Sqrt[d + e*x^2]), Int[(x*(a + b*ArcSin[c*x])^(n
 - 1))/(1 - c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e,
 0] && GtQ[n, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
```

```
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{7/2}}\,dx = \frac{x\sin^{-1}(ax)^3}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{5/2}}\,dx}{5c} - \frac{\left(3a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)^2}{\left(1-a^2x^2\right)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{3\sin^{-1}(ax)^2}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4x\sin^{-1}(ax)^3}{15c^2\left(c-a^2cx^2\right)^{3/2}} + \frac{8\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{15c^2}$$

$$= \frac{x\sin^{-1}(ax)}{10c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(ax)^2}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\sin^{-1}(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} +$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(}{20ac^3\left(1-a^2x^2\right)}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(}{20ac^3\left(1-a^2x^2\right)}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(}{20ac^3\left(1-a^2x^2\right)}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(}{20ac^3\left(1-a^2x^2\right)}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(}{20ac^3\left(1-a^2x^2\right)}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(}{20ac^3\left(1-a^2x^2\right)}$$

Mathematica [A] time = 0.726761, size = 319, normalized size = 0.58

$$-96i\sqrt{1-a^2x^2}\sin^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\sin^{-1}(ax)}\right)+48\sqrt{1-a^2x^2}\text{PolyLog}\left(3,-e^{2i\sin^{-1}(ax)}\right)-\frac{3}{\sqrt{1-a^2x^2}}+30\sqrt{1-a^2x^2}\log$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] (-3/Sqrt[1 - a^2*x^2] + 60*a*x*ArcSin[a*x] + (6*a*x*ArcSin[a*x])/(1 - a^2*x
^2) - (9*ArcSin[a*x]^2)/(1 - a^2*x^2)^(3/2) - (24*ArcSin[a*x]^2)/Sqrt[1 - a
^2*x^2] + 32*a*x*ArcSin[a*x]^3 + (16*a*x*ArcSin[a*x]^3)/(1 - a^2*x^2) - (32
*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + (12*a*x*ArcSin[a*x]^3)/(-1 + a^2*x^2)
^2 + 96*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])] + 30
*Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2] - (96*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*
PolyLog[2, -E^((2*I)*ArcSin[a*x])] + 48*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2
*I)*ArcSin[a*x])])/(60*a*c^3*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.283, size = 1017, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x)
```

```
[Out] -1/60*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/2)*x
^4*a^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*x^2*a^2+8*I*(-a^2*x^2+1)^(1/2))*(1590
*a^4*x^4*arcsin(a*x)-1410*a^2*x^2*arcsin(a*x)+105*a^3*x^3*(-a^2*x^2+1)^(1/2
)-45*a*x*(-a^2*x^2+1)^(1/2)+160*a^4*x^4*arcsin(a*x)^3+24*I*x^8*a^8+24*(-a^2
*x^2+1)^(1/2)*x^7*a^7-84*(-a^2*x^2+1)^(1/2)*a^5*x^5+24*I+256*arcsin(a*x)^3+
480*arcsin(a*x)+756*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x^5*a^5+264*I*arcsin(a
*x)^2+1020*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*x^3*a^3-495*arcsin(a*x)^2*(-a^2
*x^2+1)^(1/2)*x*a-936*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x^3*a^3+372*I*arcsin
(a*x)*(-a^2*x^2+1)^(1/2)*x*a-192*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x^7*a^7-9
6*I*x^6*a^6+144*I*x^4*a^4-96*I*a^2*x^2-380*arcsin(a*x)^3*x^2*a^2+192*arcsin
(a*x)*x^8*a^8-852*arcsin(a*x)*x^6*a^6+192*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*
x^7*a^7-744*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*x^5*a^5+192*I*arcsin(a*x)^2*x^
8*a^8-840*I*arcsin(a*x)^2*x^6*a^6+1368*I*arcsin(a*x)^2*x^4*a^4-984*I*arcsin
(a*x)^2*x^2*a^2)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+287*
a^2*x^2-64)/a-(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*l
n(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/
2)/a/c^4/(a^2*x^2-1)*ln(I*a*x+(-a^2*x^2+1)^(1/2))+16/15*I*(-a^2*x^2+1)^(1/2
)*(-c*(a^2*x^2-1))^(1/2)/a/c^4/(a^2*x^2-1)*arcsin(a*x)^3-8/5*(-c*(a^2*x^2-1
))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*arcsin(a*x)^2*ln(1+(I*a*x+(-a
^2*x^2+1)^(1/2))^2)+8/5*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)/a/c^4/(
a^2*x^2-1)*arcsin(a*x)*polylog(2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-4/5*(-c*(a^
2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*polylog(3,-(I*a*x+(-a^
2*x^2+1)^(1/2))^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\left(-a^2cx^2+c\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(7/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-a^2cx^2+c}\arcsin(ax)^3}{a^8c^4x^8-4\,a^6c^4x^6+6\,a^4c^4x^4-4\,a^2c^4x^2+c^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 +
6*a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(7/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\arcsin(ax)^3}{(-a^2cx^2+c)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(7/2), x)
```

3.302 $\int \frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2], x]
```

Rubi [A] time = 0.0831826, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Defer[Int][(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\int \frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A] time = 0.86079, size = 0, normalized size = 0.

$$\int \frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Integrate[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2], x]
```

Maple [A] time = 0.485, size = 0, normalized size = 0.

$$\int x^m (\arcsin(ax))^3 \frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\,x^m \arcsin(ax)^3}{a^2x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^3/(a^2*x^2 - 1), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \operatorname{asin}^3(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)**3/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

3.303 $\int \frac{x^4 \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=191

$$-\frac{45x^2}{128a^3} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{4a^2} + \frac{3x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{32a^2} + \frac{9x^2\sin^{-1}(ax)^2}{16a^3} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{8a^4} + \frac{45x\sqrt{1-a^2x}}{64a}$$

```
[Out] (-45*x^2)/(128*a^3) - (3*x^4)/(128*a) + (45*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]
)/(64*a^4) + (3*x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(32*a^2) - (45*ArcSin[a*
x]^2)/(128*a^5) + (9*x^2*ArcSin[a*x]^2)/(16*a^3) + (3*x^4*ArcSin[a*x]^2)/(1
6*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]^3)/(4*a^2) + (3*ArcSin[a*x]^4)/(32*a^5)
```

Rubi [A] time = 0.46789, antiderivative size = 191, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4707, 4641, 4627, 30}

$$-\frac{45x^2}{128a^3} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{4a^2} + \frac{3x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{32a^2} + \frac{9x^2\sin^{-1}(ax)^2}{16a^3} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{8a^4} + \frac{45x\sqrt{1-a^2x}}{64a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```


```
[Out] (-45*x^2)/(128*a^3) - (3*x^4)/(128*a) + (45*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]
)/(64*a^4) + (3*x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(32*a^2) - (45*ArcSin[a*
x]^2)/(128*a^5) + (9*x^2*ArcSin[a*x]^2)/(16*a^3) + (3*x^4*ArcSin[a*x]^2)/(1
6*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]^3)/(4*a^2) + (3*ArcSin[a*x]^4)/(32*a^5)
```


Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^4 \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{4a^2} + \frac{3\int \frac{x^2\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{4a^2} + \frac{3\int x^3\sin^{-1}(ax)^2\,dx}{4a}$$

$$= \frac{3x^4\sin^{-1}(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{4a^2} - \frac{3}{8}\int \frac{x^4\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx + -$$

$$= \frac{3x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{32a^2} + \frac{9x^2\sin^{-1}(ax)^2}{16a^3} + \frac{3x^4\sin^{-1}(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{8a^4} - \frac{x^3\sqrt{1-}}{}$$

$$= -\frac{3x^4}{128a} + \frac{45x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{64a^4} + \frac{3x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{32a^2} + \frac{9x^2\sin^{-1}(ax)^2}{16a^3} + \frac{3x^4\sin^{-1}(ax)^2}{16a}$$

$$= -\frac{45x^2}{128a^3} - \frac{3x^4}{128a} + \frac{45x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{64a^4} + \frac{3x^3\sqrt{1-a^2x^2}\sin^{-1}(ax)}{32a^2} - \frac{45\sin^{-1}(ax)^2}{128a^5} + \frac{9x^2 \sin}{1}$$

Mathematica [A] time = 0.0623523, size = 125, normalized size = 0.65

$$\frac{-3a^2x^2\left(a^2x^2+15\right) - 16ax\sqrt{1-a^2x^2}\left(2a^2x^2+3\right)\sin^{-1}(ax)^3 + 3\left(8a^4x^4+24a^2x^2-15\right)\sin^{-1}(ax)^2 + 6ax\sqrt{1-a^2x^2}\,(2a}{128a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*a^2*x^2*(15 + a^2*x^2) + 6*a*x*Sqrt[1 - a^2*x^2]*(15 + 2*a^2*x^2)*ArcSi
n[a*x] + 3*(-15 + 24*a^2*x^2 + 8*a^4*x^4)*ArcSin[a*x]^2 - 16*a*x*Sqrt[1 - a
^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x]^3 + 12*ArcSin[a*x]^4)/(128*a^5)
```

Maple [A] time = 0.068, size = 159, normalized size = 0.8

$$\frac{1}{128\,a^5}\Big(-32\,(\arcsin(ax))^3\sqrt{-a^2x^2+1}x^3a^3 + 24\,a^4x^4(\arcsin(ax))^2 + 12\,\arcsin(ax)\sqrt{-a^2x^2+1}x^3a^3 - 3\,a^4x^4 - 48\,($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/128*(-32*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)*x^3*a^3+24*a^4*x^4*arcsin(a*x)^
2+12*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x^3*a^3-3*a^4*x^4-48*arcsin(a*x)^3*(-a^
2*x^2+1)^(1/2)*x*a+72*arcsin(a*x)^2*x^2*a^2+12*arcsin(a*x)^4+90*arcsin(a*x)
*(-a^2*x^2+1)^(1/2)*x*a-45*a^2*x^2-45*arcsin(a*x)^2)/a^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4\arcsin(ax)^3}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A] time = 1.67244, size = 273, normalized size = 1.43

$$-\frac{3\,a^4x^4+45\,a^2x^2-12\,\arcsin\left(ax\right)^4-3\left(8\,a^4x^4+24\,a^2x^2-15\right)\arcsin\left(ax\right)^2+2\,\sqrt{-a^2x^2+1}\left(8\left(2\,a^3x^3+3\,ax\right)\arcsin\left(ax\right.\right.}{128\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/128*(3*a^4*x^4 + 45*a^2*x^2 - 12*arcsin(a*x)^4 - 3*(8*a^4*x^4 + 24*a^2*x
^2 - 15)*arcsin(a*x)^2 + 2*sqrt(-a^2*x^2 + 1)*(8*(2*a^3*x^3 + 3*a*x)*arcsin
(a*x)^3 - 3*(2*a^3*x^3 + 15*a*x)*arcsin(a*x)))/a^5
```

Sympy [A] time = 8.6755, size = 185, normalized size = 0.97

$$\begin{cases}\frac{3x^4\operatorname{asin}^2(ax)}{16a}-\frac{3x^4}{128a}-\frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{4a^2}+\frac{3x^3\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{32a^2}+\frac{9x^2\operatorname{asin}^2(ax)}{16a^3}-\frac{45x^2}{128a^3}-\frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{8a^4}+\frac{45x\sqrt{-a^2x^2+1}\operatorname{asin}}{64a^4} \\ 0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((3*x**4*asin(a*x)**2/(16*a) - 3*x**4/(128*a) - x**3*sqrt(-a**2*x*
*2 + 1)*asin(a*x)**3/(4*a**2) + 3*x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)/(32*a
**2) + 9*x**2*asin(a*x)**2/(16*a**3) - 45*x**2/(128*a**3) - 3*x*sqrt(-a**2*
x**2 + 1)*asin(a*x)**3/(8*a**4) + 45*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(64*a
**4) + 3*asin(a*x)**4/(32*a**5) - 45*asin(a*x)**2/(128*a**5), Ne(a, 0)), (0
, True))
```

Giac [A] time = 1.4601, size = 259, normalized size = 1.36

$$\frac{\left(-a^2x^2+1\right)^{\frac{3}{2}}x\arcsin\left(ax\right)^3}{4\,a^4}-\frac{5\,\sqrt{-a^2x^2+1}x\arcsin\left(ax\right)^3}{8\,a^4}-\frac{3\left(-a^2x^2+1\right)^{\frac{3}{2}}x\arcsin\left(ax\right)}{32\,a^4}+\frac{3\left(a^2x^2-1\right)^2\arcsin\left(ax\right)^2}{16\,a^5}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)^3/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arc
sin(a*x)^3/a^4 - 3/32*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)/a^4 + 3/16*(a^2*x^
2 - 1)^2*arcsin(a*x)^2/a^5 + 3/32*arcsin(a*x)^4/a^5 + 51/64*sqrt(-a^2*x^2 +
 1)*x*arcsin(a*x)/a^4 + 15/16*(a^2*x^2 - 1)*arcsin(a*x)^2/a^5 - 3/128*(a^2*
x^2 - 1)^2/a^5 + 51/128*arcsin(a*x)^2/a^5 - 51/128*(a^2*x^2 - 1)/a^5 - 195/
1024/a^5
```

3.304 $\int \frac{x^3 \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=157

$$-\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^2}+\frac{2x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^2}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^4}+\frac{40\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^4}-\frac{40x}{9a^3}+\frac{2x\,\mathrm{si}}{}$$

```
[Out] (-40*x)/(9*a^3) - (2*x^3)/(27*a) + (40*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^
4) + (2*x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^2) + (2*x*ArcSin[a*x]^2)/a^
3 + (x^3*ArcSin[a*x]^2)/(3*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^4)
 - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^2)
```

Rubi [A] time = 0.320715, antiderivative size = 157, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4707, 4677, 4619, 8, 4627, 30}

$$-\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^2}+\frac{2x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^2}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^4}+\frac{40\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^4}-\frac{40x}{9a^3}+\frac{2x\,\mathrm{si}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```


```
[Out] (-40*x)/(9*a^3) - (2*x^3)/(27*a) + (40*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^
4) + (2*x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^2) + (2*x*ArcSin[a*x]^2)/a^
3 + (x^3*ArcSin[a*x]^2)/(3*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^4)
 - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^2)
```


Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^3\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^2}+\frac{2\int \frac{x\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{3a^2}+\frac{\int x^2\sin^{-1}(ax)^2\,dx}{a}$$

$$= \frac{x^3\sin^{-1}(ax)^2}{3a}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^2}-\frac{2}{3}\int \frac{x^3\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx+\frac{2\int \sin$$

$$= \frac{2x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^2}+\frac{2x\sin^{-1}(ax)^2}{a^3}+\frac{x^3\sin^{-1}(ax)^2}{3a}-\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\,s}{3a^2}$$

$$= -\frac{2x^3}{27a}+\frac{40\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^4}+\frac{2x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^2}+\frac{2x\sin^{-1}(ax)^2}{a^3}+\frac{x^3\sin^{-1}(ax)^2}{3a}-\frac{2\sqrt{1}}{}$$

$$= -\frac{40x}{9a^3}-\frac{2x^3}{27a}+\frac{40\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^4}+\frac{2x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}{9a^2}+\frac{2x\sin^{-1}(ax)^2}{a^3}+\frac{x^3\sin^{-1}(ax)^2}{3a}$$

Mathematica [A] time = 0.0518458, size = 100, normalized size = 0.64

$$\frac{-2ax\left(a^2x^2+60\right)-9\sqrt{1-a^2x^2}\left(a^2x^2+2\right)\sin^{-1}(ax)^3+9ax\left(a^2x^2+6\right)\sin^{-1}(ax)^2+6\sqrt{1-a^2x^2}\left(a^2x^2+20\right)\sin^{-1}(ax)}{27a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-2*a*x*(60 + a^2*x^2) + 6*Sqrt[1 - a^2*x^2]*(20 + a^2*x^2)*ArcSin[a*x] + 9
*a*x*(6 + a^2*x^2)*ArcSin[a*x]^2 - 9*Sqrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin
[a*x]^3)/(27*a^4)
```

Maple [A] time = 0.056, size = 180, normalized size = 1.2

$$-\frac{1}{27a^4\left(a^2x^2-1\right)}\Big(9a^4x^4(\arcsin(ax))^3+9(\arcsin(ax))^3x^2a^2+9(\arcsin(ax))^2\sqrt{-a^2x^2+1}x^3a^3-6a^4x^4\arcsin(ax)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/27/a^4*(9*a^4*x^4*arcsin(a*x)^3+9*arcsin(a*x)^3*x^2*a^2+9*arcsin(a*x)^2*
(-a^2*x^2+1)^(1/2)*x^3*a^3-6*a^4*x^4*arcsin(a*x)-114*a^2*x^2*arcsin(a*x)-2*
```

```
a^3*x^3*(-a^2*x^2+1)^(1/2)-18*arcsin(a*x)^3+54*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)*x*a+120*arcsin(a*x)-120*a*x*(-a^2*x^2+1)^(1/2))*(-a^2*x^2+1)^(1/2)/(a^
2*x^2-1)
```

Maxima [A] time = 1.61041, size = 177, normalized size = 1.13

$$-\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}x^2}{a^2}+\frac{2\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin(ax)^3+\frac{2}{27}a\left(\frac{3\left(\sqrt{-a^2x^2+1}x^2+\frac{20\sqrt{-a^2x^2+1}}{a^2}\right)\arcsin(ax)}{a^3}-\frac{a^2x^3+60x}{a^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x^2 + 1)/a^4)*arcsin(a*x)^3
+ 2/27*a*(3*(sqrt(-a^2*x^2 + 1)*x^2 + 20*sqrt(-a^2*x^2 + 1)/a^2)*arcsin(a*x
)/a^3 - (a^2*x^3 + 60*x)/a^4) + 1/3*(a^2*x^3 + 6*x)*arcsin(a*x)^2/a^3
```

Fricas [A] time = 1.69654, size = 209, normalized size = 1.33

$$-\frac{2a^3x^3-9\left(a^3x^3+6ax\right)\arcsin(ax)^2+120ax+3\sqrt{-a^2x^2+1}\left(3\left(a^2x^2+2\right)\arcsin(ax)^3-2\left(a^2x^2+20\right)\arcsin(ax)\right)}{27a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/27*(2*a^3*x^3 - 9*(a^3*x^3 + 6*a*x)*arcsin(a*x)^2 + 120*a*x + 3*sqrt(-a^
2*x^2 + 1)*(3*(a^2*x^2 + 2)*arcsin(a*x)^3 - 2*(a^2*x^2 + 20)*arcsin(a*x)))/
a^4
```

Sympy [A] time = 4.78095, size = 148, normalized size = 0.94

$$\begin{cases}\frac{x^3\operatorname{asin}^2(ax)}{3a}-\frac{2x^3}{27a}-\frac{x^2\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{3a^2}+\frac{2x^2\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{9a^2}+\frac{2x\operatorname{asin}^2(ax)}{a^3}-\frac{40x}{9a^3}-\frac{2\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{3a^4}+\frac{40\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{9a^4} \\ 0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**3*asin(a*x)**2/(3*a) - 2*x**3/(27*a) - x**2*sqrt(-a**2*x**2 +
 1)*asin(a*x)**3/(3*a**2) + 2*x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(9*a**2)
+ 2*x*asin(a*x)**2/a**3 - 40*x/(9*a**3) - 2*sqrt(-a**2*x**2 + 1)*asin(a*x)*
*3/(3*a**4) + 40*sqrt(-a**2*x**2 + 1)*asin(a*x)/(9*a**4), Ne(a, 0)), (0, Tr
ue))
```

Giac [A] time = 1.47098, size = 174, normalized size = 1.11

$$\frac{\left(\left(-a^2x^2+1\right)^{\frac{3}{2}}-3\sqrt{-a^2x^2+1}\right)\arcsin\left(ax\right)^3}{3\,a^4}+\frac{9\left(a^2x^2-1\right)x\arcsin\left(ax\right)^2+63\,x\arcsin\left(ax\right)^2-2\left(a^2x^2-1\right)x-\frac{6\left(-a^2x^2+1\right)}{}}{27\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/3*((-a^2*x^2 + 1)^(3/2) - 3*sqrt(-a^2*x^2 + 1))*arcsin(a*x)^3/a^4 + 1/27*
(9*(a^2*x^2 - 1)*x*arcsin(a*x)^2 + 63*x*arcsin(a*x)^2 - 2*(a^2*x^2 - 1)*x -
 6*(-a^2*x^2 + 1)^(3/2)*arcsin(a*x)/a - 122*x + 126*sqrt(-a^2*x^2 + 1)*arcs
in(a*x)/a)/a^3
```

3.305 $\int \frac{x^2 \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}} \, dx$

Optimal. Leaf size=107

$$-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2a^2}+\frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2}+\frac{\sin^{-1}(ax)^4}{8a^3}-\frac{3\sin^{-1}(ax)^2}{8a^3}-\frac{3x^2}{8a}+\frac{3x^2\sin^{-1}(ax)^2}{4a}$$

```
[Out] (-3*x^2)/(8*a) + (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) - (3*ArcSin[a*
x]^2)/(8*a^3) + (3*x^2*ArcSin[a*x]^2)/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a
*x]^3)/(2*a^2) + ArcSin[a*x]^4/(8*a^3)
```

Rubi [A] time = 0.20718, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4707, 4641, 4627, 30}

$$-\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2a^2}+\frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2}+\frac{\sin^{-1}(ax)^4}{8a^3}-\frac{3\sin^{-1}(ax)^2}{8a^3}-\frac{3x^2}{8a}+\frac{3x^2\sin^{-1}(ax)^2}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*x^2)/(8*a) + (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) - (3*ArcSin[a*
x]^2)/(8*a^3) + (3*x^2*ArcSin[a*x]^2)/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a
*x]^3)/(2*a^2) + ArcSin[a*x]^4/(8*a^3)
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{x^2 \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2a^2} + \frac{\int \frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{2a^2} + \frac{3\int x\sin^{-1}(ax)^2\,dx}{2a}$$
$$= \frac{3x^2\sin^{-1}(ax)^2}{4a} - \frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2a^2} + \frac{\sin^{-1}(ax)^4}{8a^3} - \frac{3}{2}\int \frac{x^2\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx$$
$$= \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2} + \frac{3x^2\sin^{-1}(ax)^2}{4a} - \frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2a^2} + \frac{\sin^{-1}(ax)^4}{8a^3} - \frac{3\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx}{4a^2} -$$
$$= -\frac{3x^2}{8a} + \frac{3x\sqrt{1-a^2x^2}\sin^{-1}(ax)}{4a^2} - \frac{3\sin^{-1}(ax)^2}{8a^3} + \frac{3x^2\sin^{-1}(ax)^2}{4a} - \frac{x\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2a^2} + \frac{\sin^{-1}(}{8a}$$

Mathematica [A] time = 0.030338, size = 85, normalized size = 0.79

$$\frac{-3a^2x^2 - 4ax\sqrt{1-a^2x^2}\sin^{-1}(ax)^3 + \left(6a^2x^2-3\right)\sin^{-1}(ax)^2 + 6ax\sqrt{1-a^2x^2}\sin^{-1}(ax) + \sin^{-1}(ax)^4}{8a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*a^2*x^2 + 6*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + (-3 + 6*a^2*x^2)*ArcSin
[a*x]^2 - 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + ArcSin[a*x]^4)/(8*a^3)
```

Maple [A] time = 0.066, size = 85, normalized size = 0.8

$$\frac{1}{8a^3}\left(-4(\arcsin(ax))^3\sqrt{-a^2x^2+1}xa + 6(\arcsin(ax))^2x^2a^2 + (\arcsin(ax))^4 + 6\arcsin(ax)\sqrt{-a^2x^2+1}xa - 3a^2x^2 - 3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/8*(-4*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)*x*a+6*arcsin(a*x)^2*x^2*a^2+arcsin
(a*x)^4+6*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*x*a-3*a^2*x^2-3*arcsin(a*x)^2)/a^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2\arcsin(ax)^3}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A] time = 1.64896, size = 185, normalized size = 1.73

$$-\frac{3a^2x^2 - \arcsin(ax)^4 - 3\left(2a^2x^2-1\right)\arcsin(ax)^2 + 2\left(2ax\arcsin(ax)^3 - 3ax\arcsin(ax)\right)\sqrt{-a^2x^2+1}}{8a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/8*(3*a^2*x^2 - arcsin(a*x)^4 - 3*(2*a^2*x^2 - 1)*arcsin(a*x)^2 + 2*(2*a*
x*arcsin(a*x)^3 - 3*a*x*arcsin(a*x))*sqrt(-a^2*x^2 + 1))/a^3
```

Sympy [A] time = 2.78782, size = 100, normalized size = 0.93

$$\begin{cases} \frac{3x^2 \operatorname{asin}^2(ax)}{4a} - \frac{3x^2}{8a} - \frac{x\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{2a^2} + \frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{4a^2} + \frac{\operatorname{asin}^4(ax)}{8a^3} - \frac{3\operatorname{asin}^2(ax)}{8a^3} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((3*x**2*asin(a*x)**2/(4*a) - 3*x**2/(8*a) - x*sqrt(-a**2*x**2 + 1
)*asin(a*x)**3/(2*a**2) + 3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(4*a**2) + asi
n(a*x)**4/(8*a**3) - 3*asin(a*x)**2/(8*a**3), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.43573, size = 146, normalized size = 1.36

$$-\frac{\sqrt{-a^2x^2+1}x \arcsin(ax)^3}{2a^2} + \frac{\arcsin(ax)^4}{8a^3} + \frac{3\sqrt{-a^2x^2+1}x \arcsin(ax)}{4a^2} + \frac{3\left(a^2x^2-1\right)\arcsin(ax)^2}{4a^3} + \frac{3\arcsin(ax)^2}{8a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^3/a^2 + 1/8*arcsin(a*x)^4/a^3 + 3/4*s
qrt(-a^2*x^2 + 1)*x*arcsin(a*x)/a^2 + 3/4*(a^2*x^2 - 1)*arcsin(a*x)^2/a^3 +
 3/8*arcsin(a*x)^2/a^3 - 3/8*(a^2*x^2 - 1)/a^3 - 3/16/a^3
```

3.306 $\int \frac{x\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=67

$$-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{a^2}+\frac{6\sqrt{1-a^2x^2}\sin^{-1}(ax)}{a^2}-\frac{6x}{a}+\frac{3x\sin^{-1}(ax)^2}{a}$$

```
[Out] (-6*x)/a + (6*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2 + (3*x*ArcSin[a*x]^2)/a -
(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/a^2
```

Rubi [A] time = 0.105192, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4677, 4619, 8}

$$-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{a^2}+\frac{6\sqrt{1-a^2x^2}\sin^{-1}(ax)}{a^2}-\frac{6x}{a}+\frac{3x\sin^{-1}(ax)^2}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-6*x)/a + (6*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2 + (3*x*ArcSin[a*x]^2)/a -
(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/a^2
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{a^2}+\frac{3\int \sin^{-1}(ax)^2\,dx}{a}\\
&= \frac{3x\sin^{-1}(ax)^2}{a}-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{a^2}-6\int \frac{x\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx\\
&= \frac{6\sqrt{1-a^2x^2}\sin^{-1}(ax)}{a^2}+\frac{3x\sin^{-1}(ax)^2}{a}-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{a^2}-\frac{6\int 1\,dx}{a}\\
&= -\frac{6x}{a}+\frac{6\sqrt{1-a^2x^2}\sin^{-1}(ax)}{a^2}+\frac{3x\sin^{-1}(ax)^2}{a}-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{a^2}
\end{aligned}$$

Mathematica [A] time = 0.0167272, size = 61, normalized size = 0.91

$$\frac{-\sqrt{1-a^2x^2}\sin^{-1}(ax)^3+6\sqrt{1-a^2x^2}\sin^{-1}(ax)-6ax+3ax\sin^{-1}(ax)^2}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-6*a*x + 6*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + 3*a*x*ArcSin[a*x]^2 - Sqrt[1 -
a^2*x^2]*ArcSin[a*x]^3)/a^2
```

Maple [A] time = 0.046, size = 107, normalized size = 1.6

$$-\frac{1}{a^2\left(a^2x^2-1\right)}\sqrt{-a^2x^2+1}\left((\arcsin(ax))^3x^2a^2-(\arcsin(ax))^3+3(\arcsin(ax))^2\sqrt{-a^2x^2+1}xa-6a^2x^2\arcsin(ax)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(arcsin(a*x)^3*x^2*a^2-arcsin(a*x)^3+
3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*x*a-6*a^2*x^2*arcsin(a*x)+6*arcsin(a*x)-
6*a*x*(-a^2*x^2+1)^(1/2))
```

Maxima [A] time = 1.51214, size = 86, normalized size = 1.28

$$\frac{3x\arcsin(ax)^2}{a}-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^3}{a^2}-\frac{6\left(x-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)}{a}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 3*x*arcsin(a*x)^2/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/a^2 - 6*(x - sqrt(-a
^2*x^2 + 1)*arcsin(a*x)/a)/a
```

Fricas [A] time = 1.9285, size = 119, normalized size = 1.78

$$\frac{3ax\arcsin(ax)^2-6ax-\sqrt{-a^2x^2+1}\left(\arcsin(ax)^3-6\arcsin(ax)\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (3*a*x*arcsin(a*x)^2 - 6*a*x - sqrt(-a^2*x^2 + 1)*(arcsin(a*x)^3 - 6*arcsin
(a*x)))/a^2
```

Sympy [A] time = 1.41598, size = 61, normalized size = 0.91

$$\begin{cases} \frac{3x\,\mathrm{asin}^2\,(ax)}{a} - \frac{6x}{a} - \frac{\sqrt{-a^2x^2+1}\,\mathrm{asin}^3\,(ax)}{a^2} + \frac{6\sqrt{-a^2x^2+1}\,\mathrm{asin}\,(ax)}{a^2} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((3*x*asin(a*x)**2/a - 6*x/a - sqrt(-a**2*x**2 + 1)*asin(a*x)**3/a
**2 + 6*sqrt(-a**2*x**2 + 1)*asin(a*x)/a**2, Ne(a, 0)), (0, True))
```

Giac [A] time = 1.41462, size = 84, normalized size = 1.25

$$-\frac{\sqrt{-a^2x^2+1}\arcsin\,(ax)^3}{a^2} + \frac{3\left(x\arcsin\,(ax)^2 - 2\,x + \frac{2\,\sqrt{-a^2x^2+1}\arcsin(ax)}{a}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/a^2 + 3*(x*arcsin(a*x)^2 - 2*x + 2*sqrt(-
a^2*x^2 + 1)*arcsin(a*x)/a)/a
```

3.307 $\int \frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=13

$$\frac{\sin^{-1}(ax)^4}{4a}$$

```
[Out] ArcSin[a*x]^4/(4*a)
```

Rubi [A] time = 0.0295044, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4641}

$$\frac{\sin^{-1}(ax)^4}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^4/(4*a)
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\sin^{-1}(ax)^4}{4a}$$

Mathematica [A] time = 0.0039839, size = 13, normalized size = 1.

$$\frac{\sin^{-1}(ax)^4}{4a}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^4/(4*a)
```

Maple [A] time = 0.005, size = 12, normalized size = 0.9

$$\frac{(\arcsin(ax))^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

Maxima [A] time = 1.47312, size = 15, normalized size = 1.15

$$\frac{\arcsin(ax)^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

Fricas [A] time = 1.8194, size = 28, normalized size = 2.15

$$\frac{\arcsin(ax)^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

Sympy [A] time = 0.8623, size = 10, normalized size = 0.77

$$\begin{cases} \frac{\operatorname{asin}^{4}(ax)}{4a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((asin(a*x)**4/(4*a), Ne(a, 0)), (0, True))
```

Giac [A] time = 1.38032, size = 15, normalized size = 1.15

$$\frac{\arcsin(ax)^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

3.308 $\int \frac{\sin^{-1}(ax)^3}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=138

$$3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-6\sin^{-1}(ax)\text{PolyLog}\left(3,-e^{i\sin^{-1}(ax)}\right)+$$

```
[Out] -2*ArcSin[a*x]^3*ArcTanh[E^(I*ArcSin[a*x])] + (3*I)*ArcSin[a*x]^2*PolyLog[2
, -E^(I*ArcSin[a*x])] - (3*I)*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] -
 6*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 6*ArcSin[a*x]*PolyLog[3, E^
(I*ArcSin[a*x])] - (6*I)*PolyLog[4, -E^(I*ArcSin[a*x])] + (6*I)*PolyLog[4,
E^(I*ArcSin[a*x])]
```

Rubi [A] time = 0.160109, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4709, 4183, 2531, 6609, 2282, 6589}

$$3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-3i\sin^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-6\sin^{-1}(ax)\text{PolyLog}\left(3,-e^{i\sin^{-1}(ax)}\right)+$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]^3*ArcTanh[E^(I*ArcSin[a*x])] + (3*I)*ArcSin[a*x]^2*PolyLog[2
, -E^(I*ArcSin[a*x])] - (3*I)*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] -
 6*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 6*ArcSin[a*x]*PolyLog[3, E^
(I*ArcSin[a*x])] - (6*I)*PolyLog[4, -E^(I*ArcSin[a*x])] + (6*I)*PolyLog[4,
E^(I*ArcSin[a*x])]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
```

```
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = \text{Subst}\left(\int x^3\csc(x)\,dx, x, \sin^{-1}(ax)\right)$$
$$= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - 3\,\text{Subst}\left(\int x^2\log\left(1-e^{ix}\right)dx, x, \sin^{-1}(ax)\right) + 3\,\text{Subst}\left(\int x^2\log\right.$$
$$= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right) - 6i$$
$$= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right) - 6$$
$$= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right) - 6$$
$$= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right) - 6$$

Mathematica [A] time = 0.14999, size = 180, normalized size = 1.3

$$-\frac{1}{8}i\left(-24\sin^{-1}(ax)^2\text{PolyLog}\left(2,e^{-i\sin^{-1}(ax)}\right) - 24\sin^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right) + 48i\sin^{-1}(ax)\text{PolyLog}\left(3,e^{-i\sin^{-1}}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]^3/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-I/8)*(Pi^4 - 2*ArcSin[a*x]^4 + (8*I)*ArcSin[a*x]^3*Log[1 - E^((-I)*ArcSin
[a*x])] - (8*I)*ArcSin[a*x]^3*Log[1 + E^(I*ArcSin[a*x])] - 24*ArcSin[a*x]^2
*PolyLog[2, E^((-I)*ArcSin[a*x])] - 24*ArcSin[a*x]^2*PolyLog[2, -E^(I*ArcSi
n[a*x])] + (48*I)*ArcSin[a*x]*PolyLog[3, E^((-I)*ArcSin[a*x])] - (48*I)*Arc
Sin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 48*PolyLog[4, E^((-I)*ArcSin[a*x]
)] + 48*PolyLog[4, -E^(I*ArcSin[a*x])])
```

Maple [A] time = 0.066, size = 221, normalized size = 1.6

$$(\arcsin(ax))^3\ln\left(1-iax-\sqrt{-a^2x^2+1}\right) - (\arcsin(ax))^3\ln\left(1+iax+\sqrt{-a^2x^2+1}\right) + 6\arcsin(ax)\,\text{polylog}\left(3, iax+\sqrt{-}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] arcsin(a*x)^3*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-arcsin(a*x)^3*ln(1+I*a*x+(-a^2
*x^2+1)^(1/2))+6*arcsin(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))-6*arcsin(a
*x)*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))-3*I*arcsin(a*x)^2*polylog(2,I*a*x+
(-a^2*x^2+1)^(1/2))+3*I*arcsin(a*x)^2*polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))-
6*I*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))+6*I*polylog(4,I*a*x+(-a^2*x^2+1)^(
1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\sqrt{-a^2x^2+1}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^3}{a^2x^3-x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^3 - x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^3(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**3/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\sqrt{-a^2x^2+1}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x), x)
```

3.309 $\int \frac{\sin^{-1}(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=99

$$-3ia\sin^{-1}(ax)\text{PolyLog}\left(2,e^{2i\sin^{-1}(ax)}\right)+\frac{3}{2}a\text{PolyLog}\left(3,e^{2i\sin^{-1}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x}-ia\sin^{-1}(ax)^3+3a\sin^{-}$$

```
[Out] (-I)*a*ArcSin[a*x]^3 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/x + 3*a*ArcSin[a*x
]^2*Log[1 - E^((2*I)*ArcSin[a*x])] - (3*I)*a*ArcSin[a*x]*PolyLog[2, E^((2*I
)*ArcSin[a*x])] + (3*a*PolyLog[3, E^((2*I)*ArcSin[a*x])])/2
```

Rubi [A] time = 0.181608, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4681, 4625, 3717, 2190, 2531, 2282, 6589}

$$-3ia\sin^{-1}(ax)\text{PolyLog}\left(2,e^{2i\sin^{-1}(ax)}\right)+\frac{3}{2}a\text{PolyLog}\left(3,e^{2i\sin^{-1}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x}-ia\sin^{-1}(ax)^3+3a\sin^{-}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-I)*a*ArcSin[a*x]^3 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/x + 3*a*ArcSin[a*x
]^2*Log[1 - E^((2*I)*ArcSin[a*x])] - (3*I)*a*ArcSin[a*x]*PolyLog[2, E^((2*I
)*ArcSin[a*x])] + (3*a*PolyLog[3, E^((2*I)*ArcSin[a*x])])/2
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sin^{-1}(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x} + (3a)\int \frac{\sin^{-1}(ax)^2}{x}\,dx \\
&= -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x} + (3a)\,\text{Subst}\left(\int x^2\cot(x)\,dx, x, \sin^{-1}(ax)\right) \\
&= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x} - (6ia)\,\text{Subst}\left(\int \frac{e^{2ix}x^2}{1-e^{2ix}}\,dx, x, \sin^{-1}(ax)\right) \\
&= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - (6a)\,\text{Subst}\left(\int x\log\left(\right.\right. \\
&= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - 3ia\sin^{-1}(ax)\text{Li}_2\left(e^{2i\sin}\right. \\
&= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - 3ia\sin^{-1}(ax)\text{Li}_2\left(e^{2i\sin}\right. \\
&= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - 3ia\sin^{-1}(ax)\text{Li}_2\left(e^{2i\sin}\right.
\end{aligned}$$

Mathematica [A] time = 0.209354, size = 108, normalized size = 1.09

$$\frac{1}{8}a\left(24i\sin^{-1}(ax)\text{PolyLog}\left(2,e^{-2i\sin^{-1}(ax)}\right)+12\text{PolyLog}\left(3,e^{-2i\sin^{-1}(ax)}\right)-\frac{8\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{ax}+8i\sin^{-1}(ax)^3+24\,\text{s}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]^3/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a*((-I)*Pi^3 + (8*I)*ArcSin[a*x]^3 - (8*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(
a*x) + 24*ArcSin[a*x]^2*Log[1 - E^((-2*I)*ArcSin[a*x])] + (24*I)*ArcSin[a*x
]*PolyLog[2, E^((-2*I)*ArcSin[a*x])] + 12*PolyLog[3, E^((-2*I)*ArcSin[a*x])
]))/8
```

Maple [A] time = 0.105, size = 208, normalized size = 2.1

$$\frac{(\arcsin(ax))^3}{x}\left(iax-\sqrt{-a^2x^2+1}\right)-2i(\arcsin(ax))^3a-6ia\arcsin(ax)\operatorname{polylog}\left(2,iax+\sqrt{-a^2x^2+1}\right)-6ia\arcsin$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] (I*a*x-(-a^2*x^2+1)^(1/2))*arcsin(a*x)^3/x-2*I*arcsin(a*x)^3*a-6*I*a*arcsin
(a*x)*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-6*I*arcsin(a*x)*polylog(2,-I*a*x-
(-a^2*x^2+1)^(1/2))*a+3*a*arcsin(a*x)^2*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))+3*a*
arcsin(a*x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+6*a*polylog(3,I*a*x+(-a^2*x^2+
1)^(1/2))+6*a*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{\frac{3}{8}\left(x^2\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)^2+8\int\frac{\sqrt{ax+1}\sqrt{-ax+1}ax^2\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)+3\left(a^2x^3-x\right)\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)^2}{4\left(a^2x^2-1\right)}\,dx\right)a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] (3*a^3*x*integrate(x*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^2, x) - sqr
t(a*x + 1)*sqrt(-a*x + 1)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^3)/x
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^3}{a^2x^4-x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^4 - x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{asin}^3(ax)}{x^2\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/x**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**3/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\sqrt{-a^2x^2+1}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^2), x)
```

3.310 $\int \frac{\sin^{-1}(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=264

$$\frac{3}{2}ia^2\sin^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-\frac{3}{2}ia^2\sin^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-3a^2\sin^{-1}(ax)\text{PolyLog}\left(3,-e^{i\sin^{-1}\right.$$

```
[Out] (-3*a*ArcSin[a*x]^2)/(2*x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(2*x^2) - 6*
a^2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcSin[a*x]^3*ArcTanh[E^(I
*ArcSin[a*x])] + (3*I)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] + ((3*I)/2)*a^2*A
rcSin[a*x]^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[2, E^(I*Arc
Sin[a*x])] - ((3*I)/2)*a^2*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] - 3*
a^2*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 3*a^2*ArcSin[a*x]*PolyLog[
3, E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[4, -E^(I*ArcSin[a*x])] + (3*I)*a^
2*PolyLog[4, E^(I*ArcSin[a*x])]
```

Rubi [A] time = 0.357254, antiderivative size = 264, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4701, 4709, 4183, 2531, 6609, 2282, 6589, 4627, 2279, 2391}

$$\frac{3}{2}ia^2\sin^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\sin^{-1}(ax)}\right)-\frac{3}{2}ia^2\sin^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\sin^{-1}(ax)}\right)-3a^2\sin^{-1}(ax)\text{PolyLog}\left(3,-e^{i\sin^{-1}\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-3*a*ArcSin[a*x]^2)/(2*x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(2*x^2) - 6*
a^2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcSin[a*x]^3*ArcTanh[E^(I
*ArcSin[a*x])] + (3*I)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] + ((3*I)/2)*a^2*A
rcSin[a*x]^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[2, E^(I*Arc
Sin[a*x])] - ((3*I)/2)*a^2*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] - 3*
a^2*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 3*a^2*ArcSin[a*x]*PolyLog[
3, E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[4, -E^(I*ArcSin[a*x])] + (3*I)*a^
2*PolyLog[4, E^(I*ArcSin[a*x])]
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2x^2} + \frac{1}{2}(3a)\int \frac{\sin^{-1}(ax)^2}{x^2}\,dx + \frac{1}{2}a^2\int \frac{\sin^{-1}(ax)^3}{x\sqrt{1-a^2x^2}}\,dx$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2x^2} + \frac{1}{2}a^2\,\text{Subst}\left(\int x^3\csc(x)\,dx, x, \sin^{-1}(ax)\right) + \left(3a^2\right)\int \frac{}{x}$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2x^2} - a^2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - \frac{1}{2}\left(3a^2\right)\text{Subst}\left(\int\right.$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\sin^{-1}(ax)^3\tanh$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\sin^{-1}(ax)^3\tanh$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\sin^{-1}(ax)^3\tanh$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\sin^{-1}(ax)^3\tanh$$

Mathematica [A] time = 4.43164, size = 317, normalized size = 1.2

$$\frac{1}{16}a^2\left(24i\sin^{-1}(ax)^2\text{PolyLog}\left(2, e^{-i\sin^{-1}(ax)}\right) + 48\sin^{-1}(ax)\text{PolyLog}\left(3, e^{-i\sin^{-1}(ax)}\right) - 48\sin^{-1}(ax)\text{PolyLog}\left(3, -e^{i\sin}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcSin[a*x]^3/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*((-I)*Pi^4 + (2*I)*ArcSin[a*x]^4 - 12*ArcSin[a*x]^2*Cot[ArcSin[a*x]/2]
 - 2*ArcSin[a*x]^3*Csc[ArcSin[a*x]/2]^2 + 8*ArcSin[a*x]^3*Log[1 - E^((-I)*A
rcSin[a*x])] + 48*ArcSin[a*x]*Log[1 - E^(I*ArcSin[a*x])] - 48*ArcSin[a*x]*L
og[1 + E^(I*ArcSin[a*x])] - 8*ArcSin[a*x]^3*Log[1 + E^(I*ArcSin[a*x])] + (2
4*I)*ArcSin[a*x]^2*PolyLog[2, E^((-I)*ArcSin[a*x])] + (24*I)*(2 + ArcSin[a*
x]^2)*PolyLog[2, -E^(I*ArcSin[a*x])] - (48*I)*PolyLog[2, E^(I*ArcSin[a*x])]
 + 48*ArcSin[a*x]*PolyLog[3, E^((-I)*ArcSin[a*x])] - 48*ArcSin[a*x]*PolyLog
[3, -E^(I*ArcSin[a*x])] - (48*I)*PolyLog[4, E^((-I)*ArcSin[a*x])] - (48*I)*
PolyLog[4, -E^(I*ArcSin[a*x])] + 2*ArcSin[a*x]^3*Sec[ArcSin[a*x]/2]^2 - 12*
ArcSin[a*x]^2*Tan[ArcSin[a*x]/2]))/16
```

Maple [A] time = 0.167, size = 428, normalized size = 1.6

$$-\frac{(\arcsin(ax))^2}{\left(2a^2x^2-2\right)x^2}\sqrt{-a^2x^2+1}\left(a^2x^2\arcsin(ax) - 3ax\sqrt{-a^2x^2+1} - \arcsin(ax)\right) - \frac{(\arcsin(ax))^3a^2}{2}\ln\left(1+iax+\sqrt{-a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*arcsin(a*x)^2*(a^2*x^2*arcsin(a*x)-
3*a*x*(-a^2*x^2+1)^(1/2)-arcsin(a*x))-1/2*arcsin(a*x)^3*ln(1+I*a*x+(-a^2*x^
2+1)^(1/2))*a^2+1/2*arcsin(a*x)^3*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))*a^2-3*arcs
in(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))*a^2-3*a^2*arcsin(a*x)*polylog(3,-I*a
*x-(-a^2*x^2+1)^(1/2))+3*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))*a^2+3*a
^2*arcsin(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))+3/2*I*a^2*arcsin(a*x)^2*
polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))-3/2*I*a^2*arcsin(a*x)^2*polylog(2,I*a*
```

```
x+(-a^2*x^2+1)^(1/2))+3*I*a^2*polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))-3*I*a^2*
polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))-3*I*a^2*polylog(2,I*a*x+(-a^2*x^2+1)^(
1/2))+3*I*a^2*polylog(4,I*a*x+(-a^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\sqrt{-a^2x^2+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^3}{a^2x^5-x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^5 - x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^3(ax)}{x^3\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/x**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**3/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^3}{\sqrt{-a^2x^2+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

3.311 $\int \frac{(c-a^2cx^2)^3}{\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=67

$$\frac{35c^3\text{CosIntegral}\left(\sin^{-1}(ax)\right)}{64a}+\frac{21c^3\text{CosIntegral}\left(3\sin^{-1}(ax)\right)}{64a}+\frac{7c^3\text{CosIntegral}\left(5\sin^{-1}(ax)\right)}{64a}+\frac{c^3\text{CosIntegral}(}{64a}$$

```
[Out] (35*c^3*CosIntegral[ArcSin[a*x]])/(64*a) + (21*c^3*CosIntegral[3*ArcSin[a*x
]])/(64*a) + (7*c^3*CosIntegral[5*ArcSin[a*x]])/(64*a) + (c^3*CosIntegral[7
*ArcSin[a*x]])/(64*a)
```

Rubi [A] time = 0.105305, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.15, Rules used = {4661, 3312, 3302}

$$\frac{35c^3\text{CosIntegral}\left(\sin^{-1}(ax)\right)}{64a}+\frac{21c^3\text{CosIntegral}\left(3\sin^{-1}(ax)\right)}{64a}+\frac{7c^3\text{CosIntegral}\left(5\sin^{-1}(ax)\right)}{64a}+\frac{c^3\text{CosIntegral}(}{64a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^3/ArcSin[a*x],x]
```

```
[Out] (35*c^3*CosIntegral[ArcSin[a*x]])/(64*a) + (21*c^3*CosIntegral[3*ArcSin[a*x
]])/(64*a) + (7*c^3*CosIntegral[5*ArcSin[a*x]])/(64*a) + (c^3*CosIntegral[7
*ArcSin[a*x]])/(64*a)
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^3}{\sin^{-1}(ax)}\,dx = \frac{c^3\,\text{Subst}\left(\int \frac{\cos^7(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^3\,\text{Subst}\left(\int \left(\frac{35\cos(x)}{64x}+\frac{21\cos(3x)}{64x}+\frac{7\cos(5x)}{64x}+\frac{\cos(7x)}{64x}\right)dx,x,\sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^3\,\text{Subst}\left(\int \frac{\cos(7x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{64a}+\frac{(7c^3)\,\text{Subst}\left(\int \frac{\cos(5x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{64a}+\frac{(21c^3)\,\text{Subst}\left(\int \frac{\cos}{}\right.}{}$$
$$= \frac{35c^3\text{Ci}\left(\sin^{-1}(ax)\right)}{64a}+\frac{21c^3\text{Ci}\left(3\sin^{-1}(ax)\right)}{64a}+\frac{7c^3\text{Ci}\left(5\sin^{-1}(ax)\right)}{64a}+\frac{c^3\text{Ci}\left(7\sin^{-1}(ax)\right)}{64a}$$

Mathematica [A] time = 0.116208, size = 43, normalized size = 0.64

$$\frac{c^3\left(35\text{CosIntegral}\left(\sin^{-1}(ax)\right)+21\text{CosIntegral}\left(3\sin^{-1}(ax)\right)+7\text{CosIntegral}\left(5\sin^{-1}(ax)\right)+\text{CosIntegral}\left(7\sin^{-1}(a\right.\right.}{64a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^3/ArcSin[a*x],x]
```

```
[Out] (c^3*(35*CosIntegral[ArcSin[a*x]] + 21*CosIntegral[3*ArcSin[a*x]] + 7*CosIn
tegral[5*ArcSin[a*x]] + CosIntegral[7*ArcSin[a*x]]))/(64*a)
```

Maple [A] time = 0.044, size = 42, normalized size = 0.6

$$\frac{c^3\,(35\,\text{Ci}\,(\arcsin\,(ax))+21\,\text{Ci}\,(3\,\arcsin\,(ax))+7\,\text{Ci}\,(5\,\arcsin\,(ax))+\text{Ci}\,(7\,\arcsin\,(ax)))}{64\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^3/arcsin(a*x),x)
```

```
[Out] 1/64/a*c^3*(35*Ci(arcsin(a*x))+21*Ci(3*arcsin(a*x))+7*Ci(5*arcsin(a*x))+Ci(
7*arcsin(a*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int \frac{(a^2cx^2-c)^3}{\arcsin\,(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="maxima")
```

```
[Out] -integrate((a^2*c*x^2 - c)^3/arcsin(a*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^6c^3x^6-3\,a^4c^3x^4+3\,a^2c^3x^2-c^3}{\arcsin\,(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="fricas")
```

```
[Out] integral(-(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)/arcsin(a*x),
x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-c^3\left(\int \frac{3a^2x^2}{\operatorname{asin}(ax)}\,dx + \int -\frac{3a^4x^4}{\operatorname{asin}(ax)}\,dx + \int \frac{a^6x^6}{\operatorname{asin}(ax)}\,dx + \int -\frac{1}{\operatorname{asin}(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**3/asin(a*x),x)
```

```
[Out] -c**3*(Integral(3*a**2*x**2/asin(a*x), x) + Integral(-3*a**4*x**4/asin(a*x)
, x) + Integral(a**6*x**6/asin(a*x), x) + Integral(-1/asin(a*x), x))
```

Giac [A] time = 1.40599, size = 80, normalized size = 1.19

$$\frac{c^3\,\mathrm{Ci}\,(7\arcsin(ax))}{64\,a} + \frac{7\,c^3\,\mathrm{Ci}\,(5\arcsin(ax))}{64\,a} + \frac{21\,c^3\,\mathrm{Ci}\,(3\arcsin(ax))}{64\,a} + \frac{35\,c^3\,\mathrm{Ci}\,(\arcsin(ax))}{64\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="giac")
```

```
[Out] 1/64*c^3*cos_integral(7*arcsin(a*x))/a + 7/64*c^3*cos_integral(5*arcsin(a*x
))/a + 21/64*c^3*cos_integral(3*arcsin(a*x))/a + 35/64*c^3*cos_integral(arc
sin(a*x))/a
```

3.312 $\int \frac{(c-a^2cx^2)^2}{\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=50

$$\frac{5c^2\text{CosIntegral}\left(\sin^{-1}(ax)\right)}{8a}+\frac{5c^2\text{CosIntegral}\left(3\sin^{-1}(ax)\right)}{16a}+\frac{c^2\text{CosIntegral}\left(5\sin^{-1}(ax)\right)}{16a}$$

```
[Out] (5*c^2*CosIntegral[ArcSin[a*x]])/(8*a) + (5*c^2*CosIntegral[3*ArcSin[a*x]])
/(16*a) + (c^2*CosIntegral[5*ArcSin[a*x]])/(16*a)
```

Rubi [A] time = 0.0901502, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.15, Rules used = {4661, 3312, 3302}

$$\frac{5c^2\text{CosIntegral}\left(\sin^{-1}(ax)\right)}{8a}+\frac{5c^2\text{CosIntegral}\left(3\sin^{-1}(ax)\right)}{16a}+\frac{c^2\text{CosIntegral}\left(5\sin^{-1}(ax)\right)}{16a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^2/ArcSin[a*x],x]
```

```
[Out] (5*c^2*CosIntegral[ArcSin[a*x]])/(8*a) + (5*c^2*CosIntegral[3*ArcSin[a*x]])
/(16*a) + (c^2*CosIntegral[5*ArcSin[a*x]])/(16*a)
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{\left(c-a^2cx^2\right)^2}{\sin^{-1}(ax)}\,dx = \frac{c^2\,\text{Subst}\left(\int \frac{\cos^5(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^2\,\text{Subst}\left(\int \left(\frac{5\cos(x)}{8x}+\frac{5\cos(3x)}{16x}+\frac{\cos(5x)}{16x}\right)dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^2\,\text{Subst}\left(\int \frac{\cos(5x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{16a}+\frac{\left(5c^2\right)\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{16a}+\frac{\left(5c^2\right)\text{Subst}\left(\int\right.}{}$$
$$= \frac{5c^2\text{Ci}\left(\sin^{-1}(ax)\right)}{8a}+\frac{5c^2\text{Ci}\left(3\sin^{-1}(ax)\right)}{16a}+\frac{c^2\text{Ci}\left(5\sin^{-1}(ax)\right)}{16a}$$

Mathematica [A] time = 0.0779352, size = 34, normalized size = 0.68

$$\frac{c^2\left(10\text{CosIntegral}\left(\sin^{-1}(ax)\right)+5\text{CosIntegral}\left(3\sin^{-1}(ax)\right)+\text{CosIntegral}\left(5\sin^{-1}(ax)\right)\right)}{16a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^2/ArcSin[a*x],x]
```

```
[Out] (c^2*(10*CosIntegral[ArcSin[a*x]] + 5*CosIntegral[3*ArcSin[a*x]] + CosInteg
ral[5*ArcSin[a*x]]))/(16*a)
```

Maple [A] time = 0.028, size = 33, normalized size = 0.7

$$\frac{c^2\left(10\,\text{Ci}\left(\arcsin(ax)\right)+5\,\text{Ci}\left(3\arcsin(ax)\right)+\text{Ci}\left(5\arcsin(ax)\right)\right)}{16\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

```
[Out] 1/16/a*c^2*(10*Ci(arcsin(a*x))+5*Ci(3*arcsin(a*x))+Ci(5*arcsin(a*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a^2cx^2-c\right)^2}{\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 - c)^2/arcsin(a*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{a^4c^2x^4-2\,a^2c^2x^2+c^2}{\arcsin(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)/arcsin(a*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$c^2\left(\int -\frac{2a^2x^2}{\operatorname{asin}(ax)}\,dx + \int \frac{a^4x^4}{\operatorname{asin}(ax)}\,dx + \int \frac{1}{\operatorname{asin}(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**2/asin(a*x),x)
```

```
[Out] c**2*(Integral(-2*a**2*x**2/asin(a*x), x) + Integral(a**4*x**4/asin(a*x), x
) + Integral(1/asin(a*x), x))
```

Giac [A] time = 1.3557, size = 59, normalized size = 1.18

$$\frac{c^2 \operatorname{Ci}(5 \arcsin(ax))}{16a} + \frac{5c^2 \operatorname{Ci}(3 \arcsin(ax))}{16a} + \frac{5c^2 \operatorname{Ci}(\arcsin(ax))}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="giac")
```

```
[Out] 1/16*c^2*cos_integral(5*arcsin(a*x))/a + 5/16*c^2*cos_integral(3*arcsin(a*x
))/a + 5/8*c^2*cos_integral(arcsin(a*x))/a
```

3.313 $\int \frac{c-a^2cx^2}{\sin^{-1}(ax)} dx$

Optimal. Leaf size=29

$$\frac{3c\text{CosIntegral}\left(\sin^{-1}(ax)\right)}{4a}+\frac{c\text{CosIntegral}\left(3\sin^{-1}(ax)\right)}{4a}$$

```
[Out] (3*c*CosIntegral[ArcSin[a*x]])/(4*a) + (c*CosIntegral[3*ArcSin[a*x]])/(4*a)
```

Rubi [A] time = 0.0639881, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4661, 3312, 3302}

$$\frac{3c\text{CosIntegral}\left(\sin^{-1}(ax)\right)}{4a}+\frac{c\text{CosIntegral}\left(3\sin^{-1}(ax)\right)}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)/ArcSin[a*x],x]
```

```
[Out] (3*c*CosIntegral[ArcSin[a*x]])/(4*a) + (c*CosIntegral[3*ArcSin[a*x]])/(4*a)
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{c-a^2cx^2}{\sin^{-1}(ax)} dx &= \frac{c\,\text{Subst}\left(\int \frac{\cos^3(x)}{x} dx, x, \sin^{-1}(ax)\right)}{a}\\
&= \frac{c\,\text{Subst}\left(\int \left(\frac{3\cos(x)}{4x}+\frac{\cos(3x)}{4x}\right) dx, x, \sin^{-1}(ax)\right)}{a}\\
&= \frac{c\,\text{Subst}\left(\int \frac{\cos(3x)}{x} dx, x, \sin^{-1}(ax)\right)}{4a}+\frac{(3c)\,\text{Subst}\left(\int \frac{\cos(x)}{x} dx, x, \sin^{-1}(ax)\right)}{4a}\\
&= \frac{3c\text{Ci}\left(\sin^{-1}(ax)\right)}{4a}+\frac{c\text{Ci}\left(3\sin^{-1}(ax)\right)}{4a}
\end{aligned}$$

Mathematica [A] time = 0.0188957, size = 23, normalized size = 0.79

$$\frac{c\left(3\text{CosIntegral}\left(\sin^{-1}(ax)\right)+\text{CosIntegral}\left(3\sin^{-1}(ax)\right)\right)}{4a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)/ArcSin[a*x],x]
```

```
[Out] (c*(3*CosIntegral[ArcSin[a*x]] + CosIntegral[3*ArcSin[a*x]]))/(4*a)
```

Maple [A] time = 0.028, size = 22, normalized size = 0.8

$$\frac{c\left(3\,\mathrm{Ci}\left(\arcsin\left(ax\right)\right)+\mathrm{Ci}\left(3\,\arcsin\left(ax\right)\right)\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)/arcsin(a*x),x)
```

```
[Out] 1/4/a*c*(3*Ci(arcsin(a*x))+Ci(3*arcsin(a*x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int \frac{a^2cx^2-c}{\arcsin\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="maxima")
```

```
[Out] -integrate((a^2*c*x^2 - c)/arcsin(a*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2cx^2-c}{\arcsin\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c*x^2 - c)/arcsin(a*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-c\left(\int \frac{a^2x^2}{\operatorname{asin}\left(ax\right)}\,dx+\int -\frac{1}{\operatorname{asin}\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)/asin(a*x),x)
```

```
[Out] -c*(Integral(a**2*x**2/asin(a*x), x) + Integral(-1/asin(a*x), x))
```

Giac [A] time = 1.32514, size = 34, normalized size = 1.17

$$\frac{c\,\mathrm{Ci}\,(3\,\arcsin\,(ax))}{4\,a}+\frac{3\,c\,\mathrm{Ci}\,(\arcsin\,(ax))}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="giac")
```

```
[Out] 1/4*c*cos_integral(3*arcsin(a*x))/a + 3/4*c*cos_integral(arcsin(a*x))/a
```

3.314 $\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{1}{(c-a^2cx^2)\sin^{-1}(ax)},x\right)$$

```
[Out] Unintegrable[1/((c - a^2*c*x^2)*ArcSin[a*x]), x]
```

Rubi [A] time = 0.0241084, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)*ArcSin[a*x]),x]
```

```
[Out] Defer[Int][1/((c - a^2*c*x^2)*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)}\,dx = \int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)}\,dx$$

Mathematica [A] time = 2.53318, size = 0, normalized size = 0.

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]), x]
```

Maple [A] time = 0.099, size = 0, normalized size = 0.

$$\int \frac{1}{(-a^2cx^2+c)\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{1}{(a^2cx^2 - c)\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="maxima")
```

```
[Out] -integrate(1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{1}{(a^2cx^2 - c)\arcsin(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="fricas")
```

```
[Out] integral(-1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{1}{a^2x^2\operatorname{asin}(ax) - \operatorname{asin}(ax)}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)/asin(a*x),x)
```

```
[Out] -Integral(1/(a**2*x**2*asin(a*x) - asin(a*x)), x)/c
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{1}{(a^2cx^2 - c)\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="giac")
```

```
[Out] integrate(-1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

3.315 $\int \frac{1}{\left(c-a^2cx^2\right)^2\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{1}{\left(c-a^2cx^2\right)^2\sin^{-1}(ax)},x\right)$$

```
[Out] Unintegrable[1/((c - a^2*c*x^2)^2*ArcSin[a*x]), x]
```

Rubi [A] time = 0.0236022, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^2\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^2*ArcSin[a*x]),x]

[Out] Defer[Int][1/((c - a^2*c*x^2)^2*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^2\sin^{-1}(ax)}\,dx=\int \frac{1}{\left(c-a^2cx^2\right)^2\sin^{-1}(ax)}\,dx$$

Mathematica [A] time = 7.68028, size = 0, normalized size = 0.

$$\int \frac{1}{\left(c-a^2cx^2\right)^2\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]),x]

[Out] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]), x]
```

Maple [A] time = 0.259, size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^2cx^2+c\right)^2\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a^2cx^2-c\right)^2 \arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\left(a^4c^2x^4-2\,a^2c^2x^2+c^2\right)\arcsin(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="fricas")
```

```
[Out] integral(1/((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*arcsin(a*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{1}{a^4x^4\operatorname{asin}(ax)-2a^2x^2\operatorname{asin}(ax)+\operatorname{asin}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**2/asin(a*x),x)
```

```
[Out] Integral(1/(a**4*x**4*asin(a*x) - 2*a**2*x**2*asin(a*x) + asin(a*x)), x)/c*
*2
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a^2cx^2-c\right)^2 \arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)), x)
```

3.316 $\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=206

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{32bc^5}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^5}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{32bc^5}$$

```
[Out] -(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^5) - (Cos[(4
*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (Cos[(6*a)/b]*C
osIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^5) + Log[a + b*ArcSin[c*x]]/
(16*b*c^5) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^
5) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (Si
n[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^5)
```

Rubi [A] time = 0.460128, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^5}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc^5}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6a}{b}+6\text{s}\right.}{32bc^5}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c^5) - (Cos[(4*a
)/b]*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(16*b*c^5) + (Cos[(6*a)/b]*CosIn
tegral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c^5) + Log[a + b*ArcSin[c*x]]/(16*b*
c^5) - (Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c^5) - (Si
n[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(16*b*c^5) + (Sin[(6*a)/b]
*SinIntegral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c^5)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^4(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^5}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{16(a+bx)} - \frac{\cos(2x)}{32(a+bx)} - \frac{\cos(4x)}{16(a+bx)} + \frac{\cos(6x)}{32(a+bx)}\right) dx, x, \sin^{-1}(cx)\right)}{c^5}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^5} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^5} + \frac{\text{Subst}\left(\int \frac{\cos(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^5}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^5} - \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\text{co}}{}\right.}{1}$$
$$= -\frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc^5} + \frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}+6\sin^{-1}\right.}{32bc^5}$$

Mathematica [A] time = 0.42325, size = 152, normalized size = 0.74

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+2\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(6\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 2*Cos[(4*a)/b]*CosInteg
ral[4*(a/b + ArcSin[c*x])] - Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[c*x])
] - 2*Log[a + b*ArcSin[c*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x
])] + 2*Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] - Sin[(6*a)/b]*SinI
ntegral[6*(a/b + ArcSin[c*x])])/(32*b*c^5)
```

Maple [A] time = 0.057, size = 193, normalized size = 0.9

$$-\frac{1}{32c^5b}\text{Si}\left(2\arcsin(cx)+2\frac{a}{b}\right)\sin\left(2\frac{a}{b}\right)-\frac{1}{32c^5b}\text{Ci}\left(2\arcsin(cx)+2\frac{a}{b}\right)\cos\left(2\frac{a}{b}\right)+\frac{1}{32c^5b}\text{Si}\left(6\arcsin(cx)+6\frac{a}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] -1/32/c^5/b*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-1/32/c^5/b*Ci(2*arcsin(c*x)+
2*a/b)*cos(2*a/b)+1/32/c^5/b*Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+1/32/c^5/b*
```

```
Ci(6*arcsin(c*x)+6*a/b)*cos(6*a/b)-1/16/c^5/b*Si(4*arcsin(c*x)+4*a/b)*sin(4
*a/b)-1/16/c^5/b*Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b)+1/16*ln(a+b*arcsin(c*x)
)/b/c^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}x^4}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^4/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}x^4}{b\arcsin(cx)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^4/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**4*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [B] time = 1.48889, size = 637, normalized size = 3.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) + cos(a/b)^5*sin(a/b
)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) - 3/2*cos(a/b)^4*cos_integral
(6*a/b + 6*arcsin(c*x))/(b*c^5) - 1/2*cos(a/b)^4*cos_integral(4*a/b + 4*arc
sin(c*x))/(b*c^5) - cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))
```

```
/(b*c^5) - 1/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c
^5) + 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) + 1/2*cos
(a/b)^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) - 1/16*cos(a/b)^2*cos_i
ntegral(2*a/b + 2*arcsin(c*x))/(b*c^5) + 3/16*cos(a/b)*sin(a/b)*sin_integra
l(6*a/b + 6*arcsin(c*x))/(b*c^5) + 1/4*cos(a/b)*sin(a/b)*sin_integral(4*a/b
 + 4*arcsin(c*x))/(b*c^5) - 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^5) - 1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) - 1/
16*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + 1/32*cos_integral(2*a/b +
2*arcsin(c*x))/(b*c^5) + 1/16*log(b*arcsin(c*x) + a)/(b*c^5)
```

3.317 $\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=183

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8bc^4}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^4}+\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^4}+$$

```
[Out] -(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b*c^4) - (CosIntegral[(3*
(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^4) + (CosIntegral[(5*(a + b*A
rcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^4) + (Cos[a/b]*SinIntegral[(a + b*Arc
Sin[c*x])/b])/(8*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))
/b])/(16*b*c^4) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16
*b*c^4)
```

Rubi [A] time = 0.430418, antiderivative size = 179, normalized size of antiderivative = 0.98, number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8bc^4}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16bc^4}+\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)}{16bc^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(8*b*c^4) - (CosIntegral[(3*a)/b
 + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(16*b*c^4) + (CosIntegral[(5*a)/b + 5*ArcSi
n[c*x]]*Sin[(5*a)/b])/(16*b*c^4) + (Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]]
)/(8*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b*c^4
) - (Cos[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b*c^4)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^4}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{\sin(x)}{8(a+bx)}+\frac{\sin(3x)}{16(a+bx)}-\frac{\sin(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^4}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^4} - \frac{\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^4} + \frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x,\right.}{8c^4}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^4} -$$
$$= -\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^4} - \frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16bc^4} + \frac{\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)\sin\left(\frac{5a}{b}\right)}{16bc^4}$$

Mathematica [A] time = 0.323091, size = 135, normalized size = 0.74

$$\frac{-2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{s}\right.\right.}{16bc^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcSin[c
*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + 2*Co
s[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/b]*SinIntegral[3*(a/b + A
rcSin[c*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*c^4)
```

Maple [A] time = 0.048, size = 138, normalized size = 0.8

$$-\frac{1}{16c^4b}\left(\text{Si}\left(5\arcsin(cx)+5\frac{a}{b}\right)\cos\left(5\frac{a}{b}\right)-\text{Ci}\left(5\arcsin(cx)+5\frac{a}{b}\right)\sin\left(5\frac{a}{b}\right)+2\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] -1/16/c^4*(Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5
*a/b)+2*Ci(arcsin(c*x)+a/b)*sin(a/b)-2*Si(arcsin(c*x)+a/b)*cos(a/b)-Si(3*ar
csin(c*x)+3*a/b)*cos(3*a/b)+Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}x^3}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^3/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^3}{b\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3\sqrt{-(cx-1)(cx+1)}}{a+b\,\text{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [B] time = 1.37447, size = 486, normalized size = 2.66

$$\frac{\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^4}-\frac{\cos\left(\frac{a}{b}\right)^5\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{bc^4}-\frac{3\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^
5*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^4) - 3/4*cos(a/b)^2*cos_integral
(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/4*cos(a/b)^2*cos_integral(3*a/
b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) + 5/4*cos(a/b)^3*sin_integral(5*a/b + 5
*arcsin(c*x))/(b*c^4) + 1/4*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/
(b*c^4) + 1/16*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) + 1/16*
cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/8*cos_integral(a/b
```

```
 + arcsin(c*x))*sin(a/b)/(b*c^4) - 5/16*cos(a/b)*sin_integral(5*a/b + 5*arc
sin(c*x))/(b*c^4) - 3/16*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^
4) + 1/8*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^4)
```

3.318 $\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=82

$$-\frac{\cos\left(\frac{4a}{b}\right)\mathrm{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{8bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\mathrm{Si}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{8bc^3}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3}$$

```
[Out] -(Cos[(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c^3) + Log[a +
b*ArcSin[c*x]]/(8*b*c^3) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x])
)/b])/(8*b*c^3)
```

Rubi [A] time = 0.250688, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{\cos\left(\frac{4a}{b}\right)\mathrm{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\mathrm{Si}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^3}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(Cos[(4*a)/b]*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b*c^3) + Log[a + b*
ArcSin[c*x]]/(8*b*c^3) - (Sin[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]]
)/(8*b*c^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{1}{8(a+bx)} - \frac{\cos(4x)}{8(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3} - \frac{\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^3}$$

$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}+4x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin}{}\right.}{8}$$

$$= -\frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^3} + \frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^3}$$

Mathematica [A] time = 0.181625, size = 66, normalized size = 0.8

$$-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\sin\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-\log\left(8\left(a+b\sin^{-1}(cx)\right)\right)}{8bc^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(Cos[(4*a)/b]*CosIntegral[4*(a/b + ArcSin[c*x])] - Log[8*(a + b*ArcSin[c*x
])] + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])])/(8*b*c^3)
```

Maple [A] time = 0.046, size = 77, normalized size = 0.9

$$-\frac{1}{8c^3b}\text{Si}\left(4\arcsin(cx)+4\frac{a}{b}\right)\sin\left(4\frac{a}{b}\right)-\frac{1}{8c^3b}\text{Ci}\left(4\arcsin(cx)+4\frac{a}{b}\right)\cos\left(4\frac{a}{b}\right)+\frac{\ln(a+b\arcsin(cx))}{8c^3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] -1/8/c^3/b*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)-1/8/c^3/b*Ci(4*arcsin(c*x)+4*
a/b)*cos(4*a/b)+1/8*ln(a+b*arcsin(c*x))/b/c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}\,x^2}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^2/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^2}{b\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [B] time = 1.37644, size = 228, normalized size = 2.78

$$-\frac{\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^3}-\frac{\cos\left(\frac{a}{b}\right)^3 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^3}+\frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^3}+\frac{\cos\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) - cos(a/b)^3*sin(a/
b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + cos(a/b)^2*cos_integral(4*
a/b + 4*arcsin(c*x))/(b*c^3) + 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4
*arcsin(c*x))/(b*c^3) - 1/8*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1
/8*log(b*arcsin(c*x) + a)/(b*c^3)
```

3.319 $\int \frac{x\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=121

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4bc^2}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{4bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4bc^2}+\frac{\cos\left(\frac{3a}{b}\right)\text{Si}}{}$$

```
[Out] -(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b*c^2) - (CosIntegral[(3*
(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b*c^2) + (Cos[a/b]*SinIntegral[(a
+ b*ArcSin[c*x])/b])/(4*b*c^2) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin
[c*x]))/b])/(4*b*c^2)
```

Rubi [A] time = 0.26212, antiderivative size = 117, normalized size of antiderivative = 0.97, number of steps used = 9, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^2}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^2}+\frac{\cos}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(4*b*c^2) - (CosIntegral[(3*a)/b
 + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(4*b*c^2) + (Cos[a/b]*SinIntegral[a/b + Arc
Sin[c*x]])/(4*b*c^2) + (Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/
(4*b*c^2)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^2}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{\sin(x)}{4(a+bx)} + \frac{\sin(3x)}{4(a+bx)}\right) dx, x, \sin^{-1}(cx)\right)}{c^2}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^2} + \frac{\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^2}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^2} + \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^2} - \dots$$
$$= -\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^2} - \frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{4bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^2} + \dots$$

Mathematica [A] time = 0.206777, size = 91, normalized size = 0.75

$$\frac{\sin\left(\frac{a}{b}\right)\left(-\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) - \sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) + \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right) + \cos\left(\dots\right.}{4bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b]) - CosIntegral[3*(a/b + ArcSin[c
*x])]*Sin[(3*a)/b] + Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/b]
*SinIntegral[3*(a/b + ArcSin[c*x])])/(4*b*c^2)
```

Maple [A] time = 0.041, size = 92, normalized size = 0.8

$$\frac{1}{4c^2b}\left(\text{Si}\left(3\arcsin(cx)+3\frac{a}{b}\right)\cos\left(3\frac{a}{b}\right) - \text{Ci}\left(3\arcsin(cx)+3\frac{a}{b}\right)\sin\left(3\frac{a}{b}\right) + \text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right) - \text{Ci}\left(\arcsin\dots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/4/c^2*(Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-Ci(3*arcsin(c*x)+3*a/b)*sin(3*a
/b)+Si(arcsin(c*x)+a/b)*cos(a/b)-Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}\,x}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x}{b\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [A] time = 1.39985, size = 232, normalized size = 1.92

$$-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2}+\frac{\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^2}+\frac{\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^2}-\frac{\operatorname{Ci}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/4*cos_integral(3*a/b + 3
*arcsin(c*x))*sin(a/b)/(b*c^2) - 1/4*cos_integral(a/b + arcsin(c*x))*sin(a/
b)/(b*c^2) - 3/4*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/4
*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

3.320 $\int \frac{\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=82

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2bc}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc}$$

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c) + Log[a + b*A
rcSin[c*x]]/(2*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])
/(2*b*c)
```

Rubi [A] time = 0.166245, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4661, 3312, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b*c) + Log[a + b*Arc
Sin[c*x]]/(2*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*
b*c)
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{2(a+bx)} + \frac{\cos(2x)}{2(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc} + \frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c} + \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin}{}\right.}{}$$
$$= \frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc} + \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}$$

Mathematica [A] time = 0.151783, size = 62, normalized size = 0.76

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\log\left(a+b\sin^{-1}(cx)\right)}{2bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Log[a + b*ArcSin[c*x]] +
 Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(2*b*c)
```

Maple [A] time = 0.041, size = 77, normalized size = 0.9

$$\frac{1}{2\,bc}\text{Si}\left(2\,\arcsin(cx)+2\,\frac{a}{b}\right)\sin\left(2\,\frac{a}{b}\right)+\frac{1}{2\,bc}\text{Ci}\left(2\,\arcsin(cx)+2\,\frac{a}{b}\right)\cos\left(2\,\frac{a}{b}\right)+\frac{\ln(a+b\arcsin(cx))}{2\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/2/c/b*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+1/2/c/b*Ci(2*arcsin(c*x)+2*a/b)*
cos(2*a/b)+1/2*ln(a+b*arcsin(c*x))/b/c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}}{b\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-(cx-1)(cx+1)}}{a+b\,\text{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [A] time = 1.42194, size = 138, normalized size = 1.68

$$\frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc}-\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc}+\frac{\log(b\arcsin(cx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c) + cos(a/b)*sin(a/b)*si
n_integral(2*a/b + 2*arcsin(c*x))/(b*c) - 1/2*cos_integral(2*a/b + 2*arcsin
(c*x))/(b*c) + 1/2*log(b*arcsin(c*x) + a)/(b*c)
```

3.321 $\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=78

$$\text{Unintegrable}\left(\frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)+\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b}$$

```
[Out] (CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/b - (Cos[a/b]*SinIntegral[(a
+ b*ArcSin[c*x])/b])/b + Unintegrable[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x])), x]
```

Rubi [A] time = 0.398859, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/b - (Cos[a/b]*SinIntegral[a/b + A
rcSin[c*x]])/b + Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx &= \int \left(\frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}-\frac{c^2x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\right)dx\\
&= -\left(c^2\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx\right)+\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx\\
&= \int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx-\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)\\
&= -\left(\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x\right.\\
&= \frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b}+\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}
\end{aligned}$$

Mathematica [A] time = 2.86417, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.267, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin\left(cx\right)\right)}\sqrt{-c^{2}x^{2}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^{2}x^{2}+1}}{\left(b\arcsin\left(cx\right)+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^{2}x^{2}+1}}{bx\arcsin\left(cx\right)+ax}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x*arcsin(c*x) + a*x), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x), x)
```

3.322 $\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=46

$$\text{Unintegrable}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)-\frac{c\log\left(a+b\sin^{-1}(cx)\right)}{b}$$

```
[Out] -((c*Log[a + b*ArcSin[c*x]])/b) + Unintegrable[1/(x^2*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.297701, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((c*Log[a + b*ArcSin[c*x]])/b) + Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx &= \int \left(-\frac{c^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}+\frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\right)dx\\
&= -\left(c^2\int \frac{1}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx\right)+\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx\\
&= -\frac{c\log\left(a+b\sin^{-1}(cx)\right)}{b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx
\end{aligned}$$

Mathematica [A] time = 0.859009, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.317, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}}{bx^2\arcsin(cx)+ax^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-(cx-1)(cx+1)}}{x^2(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**2/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**2*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^2), x)
```

3.323 $\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.120526, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 5.28264, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 2.18, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+b\arcsin(cx)\right)}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}}{bx^3\arcsin(cx)+ax^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^3*arcsin(c*x) + a*x^3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-(cx-1)(cx+1)}}{x^3(a+b\,\mathrm{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**3/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**3*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^3), x)
```

3.324 $\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.119873, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.749699, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 3.641, size = 0, normalized size = 0.

$$\int \frac{1}{x^4\left(a+b\arcsin(cx)\right)}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^4), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}}{bx^4\arcsin(cx)+ax^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^4*arcsin(c*x) + a*x^4), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-(cx-1)(cx+1)}}{x^4(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**4/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**4*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^4), x)
```

3.325 $\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=245

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{64bc^4}-\frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{64bc^4}+\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\sin^{-1}(cx))}{b}\right)}{64bc^4}$$

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(64*b*c^4) - (3*CosIntegra
l[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(64*b*c^4) + (CosIntegral[(5*(a
+ b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(64*b*c^4) + (CosIntegral[(7*(a + b*ArcS
in[c*x]))/b]*Sin[(7*a)/b])/(64*b*c^4) + (3*Cos[a/b]*SinIntegral[(a + b*ArcS
in[c*x])/b])/(64*b*c^4) + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]
))/b])/(64*b*c^4) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(
64*b*c^4) - (Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b*c^4
)
```

Rubi [A] time = 0.499066, antiderivative size = 241, normalized size of antiderivative = 0.98, number of steps used = 15, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64bc^4}-\frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{64bc^4}+\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)}{64bc^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(64*b*c^4) - (3*CosIntegral[(3
*a)/b + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(64*b*c^4) + (CosIntegral[(5*a)/b + 5*
ArcSin[c*x]]*Sin[(5*a)/b])/(64*b*c^4) + (CosIntegral[(7*a)/b + 7*ArcSin[c*x
]]*Sin[(7*a)/b])/(64*b*c^4) + (3*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(
64*b*c^4) + (3*Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(64*b*c^4
) - (Cos[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(64*b*c^4) - (Cos[(
7*a)/b]*SinIntegral[(7*a)/b + 7*ArcSin[c*x]])/(64*b*c^4)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3\left(1-c^2x^2\right)^{3/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^4(x)\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^4}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{64(a+bx)} + \frac{3\sin(3x)}{64(a+bx)} - \frac{\sin(5x)}{64(a+bx)} - \frac{\sin(7x)}{64(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^4}$$

$$= -\frac{\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^4} - \frac{\text{Subst}\left(\int \frac{\sin(7x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^4} + \frac{3\,\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx\right.}{64c^4}$$

$$= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^4} + \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \sin^{-1}\right.}{64c^4}$$

$$= -\frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^4} - \frac{3\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{64bc^4} + \frac{\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)\sin\left(\right.}{64bc^4}$$

Mathematica [A] time = 0.752081, size = 179, normalized size = 0.73

$$-3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) - 3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) + \sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + Co
sIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] + 3*Cos[a/b]*SinIntegral[a/b
+ ArcSin[c*x]] + 3*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - Cos[(5
*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] - Cos[(7*a)/b]*SinIntegral[7*(a/b
 + ArcSin[c*x])])/(64*b*c^4)
```

Maple [A] time = 0.053, size = 184, normalized size = 0.8

$$\frac{1}{64\,c^4b}\left(3\,\text{Si}\left(3\,\arcsin(cx)+3\,\frac{a}{b}\right)\cos\left(3\,\frac{a}{b}\right)+\text{Ci}\left(7\,\arcsin(cx)+7\,\frac{a}{b}\right)\sin\left(7\,\frac{a}{b}\right)-3\,\text{Ci}\left(3\,\arcsin(cx)+3\,\frac{a}{b}\right)\sin\left(3\,\frac{a}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/64/c^4*(3*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)+Ci(7*arcsin(c*x)+7*a/b)*sin(
7*a/b)-3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)-Si(5*arcsin(c*x)+5*a/b)*cos(5*a
/b)+Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)+3*Si(arcsin(c*x)+a/b)*cos(a/b)-3*Ci(
arcsin(c*x)+a/b)*sin(a/b)-Si(7*arcsin(c*x)+7*a/b)*cos(7*a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}x^3}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^3/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(c^2x^5-x^3\right)\sqrt{-c^2x^2+1}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^5 - x^3)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{a+b\,\mathrm{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [B] time = 1.39014, size = 829, normalized size = 3.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^
7*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 5/4*cos(a/b)^4*cos_integral
(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 1/4*cos(a/b)^4*cos_integral(5*a/
b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) + 7/4*cos(a/b)^5*sin_integral(7*a/b + 7
*arcsin(c*x))/(b*c^4) - 1/4*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))/
(b*c^4) + 3/8*cos(a/b)^2*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^
4) - 3/16*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) -
 3/16*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 7/8
*cos(a/b)^3*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) + 5/16*cos(a/b)^3*s
in_integral(5*a/b + 5*arcsin(c*x))/(b*c^4) + 3/16*cos(a/b)^3*sin_integral(3
*a/b + 3*arcsin(c*x))/(b*c^4) - 1/64*cos_integral(7*a/b + 7*arcsin(c*x))*si
n(a/b)/(b*c^4) + 1/64*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4)
+ 3/64*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/64*cos_inte
gral(a/b + arcsin(c*x))*sin(a/b)/(b*c^4) + 7/64*cos(a/b)*sin_integral(7*a/b
 + 7*arcsin(c*x))/(b*c^4) - 5/64*cos(a/b)*sin_integral(5*a/b + 5*arcsin(c*x
))/(b*c^4) - 9/64*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 3/
64*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^4)
```

3.326 $\int \frac{x^2\left(1-c^2x^2\right)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=206

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{32bc^3}$$

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(4*
a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^3) - (Cos[(6*a)/b]*Co
sIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) + Log[a + b*ArcSin[c*x]]/(
16*b*c^3) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3
) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^3) - (Sin
[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3)
```

Rubi [A] time = 0.423249, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 4406, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6a}{b}+6\sin\right.}{32bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c^3) - (Cos[(4*a)
/b]*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(16*b*c^3) - (Cos[(6*a)/b]*CosInt
egral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c^3) + Log[a + b*ArcSin[c*x]]/(16*b*c
^3) + (Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c^3) - (Sin
[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(16*b*c^3) - (Sin[(6*a)/b]*
SinIntegral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^2\left(1-c^2x^2\right)^{3/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^4(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{1}{16(a+bx)}+\frac{\cos(2x)}{32(a+bx)}-\frac{\cos(4x)}{16(a+bx)}-\frac{\cos(6x)}{32(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^3}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3}-\frac{\text{Subst}\left(\int \frac{\cos(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3}$$

$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \right.}{}$$

$$= \frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}+6\sin^{-1}(c\right.}{32bc^3}$$

Mathematica [A] time = 0.595416, size = 165, normalized size = 0.8

$$-\frac{-\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+2\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(-(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])]) + 2*Cos[(4*a)/b]*CosIn
tegral[4*(a/b + ArcSin[c*x])] + Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[c*
x])] + 2*Log[a + b*ArcSin[c*x]] - 4*Log[8*(a + b*ArcSin[c*x])] - Sin[(2*a)/
b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 2*Sin[(4*a)/b]*SinIntegral[4*(a/b +
 ArcSin[c*x])] + Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(32*b*c^3
)
```

Maple [A] time = 0.05, size = 193, normalized size = 0.9

$$-\frac{1}{16\,bc^3}\text{Si}\left(4\arcsin(cx)+4\frac{a}{b}\right)\sin\left(4\frac{a}{b}\right)-\frac{1}{16\,bc^3}\text{Ci}\left(4\arcsin(cx)+4\frac{a}{b}\right)\cos\left(4\frac{a}{b}\right)+\frac{1}{32\,bc^3}\text{Si}\left(2\arcsin(cx)+2\frac{a}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] -1/16/c^3/b*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)-1/16/c^3/b*Ci(4*arcsin(c*x)+
4*a/b)*cos(4*a/b)+1/32/c^3/b*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+1/32/c^3/b*
Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)-1/32/c^3/b*Si(6*arcsin(c*x)+6*a/b)*sin(6
*a/b)-1/32/c^3/b*Ci(6*arcsin(c*x)+6*a/b)*cos(6*a/b)+1/16*ln(a+b*arcsin(c*x)
)/b/c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}x^2}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^2/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(c^2x^4-x^2\right)\sqrt{-c^2x^2+1}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^4 - x^2)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{a+b\operatorname{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [B] time = 1.37152, size = 639, normalized size = 3.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - cos(a/b)^5*sin(a/
b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 3/2*cos(a/b)^4*cos_integra
l(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/2*cos(a/b)^4*cos_integral(4*a/b + 4*ar
csin(c*x))/(b*c^3) + cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x)
)/(b*c^3) - 1/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*
c^3) - 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/2*co
s(a/b)^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)^2*cos_
integral(2*a/b + 2*arcsin(c*x))/(b*c^3) - 3/16*cos(a/b)*sin(a/b)*sin_integr
al(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/4*cos(a/b)*sin(a/b)*sin_integral(4*a/
b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*
arcsin(c*x))/(b*c^3) + 1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1
/16*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) - 1/32*cos_integral(2*a/b +
 2*arcsin(c*x))/(b*c^3) + 1/16*log(b*arcsin(c*x) + a)/(b*c^3)
```

3.327 $\int \frac{x\left(1-c^2x^2\right)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=183

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8bc^2}-\frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^2}-\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^2}+$$

```
[Out] -(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b*c^2) - (3*CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^2) - (CosIntegral[(5*(a + b
*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^2) + (Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(8*b*c^2) + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*
x]))/b])/(16*b*c^2) + (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])
/(16*b*c^2)
```

Rubi [A] time = 0.344317, antiderivative size = 179, normalized size of antiderivative = 0.98, number of steps used = 12, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8bc^2}-\frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16bc^2}-\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+5\sin^{-1}\right.}{16bc^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(8*b*c^2) - (3*CosIntegral[(3*a)
/b + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(16*b*c^2) - (CosIntegral[(5*a)/b + 5*Arc
Sin[c*x]]*Sin[(5*a)/b])/(16*b*c^2) + (Cos[a/b]*SinIntegral[a/b + ArcSin[c*x
]])/(8*b*c^2) + (3*Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b
*c^2) + (Cos[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b*c^2)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x\left(1-c^2x^2\right)^{3/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\operatorname{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^2}$$
$$= \frac{\operatorname{Subst}\left(\int \left(\frac{\sin(x)}{8(a+bx)}+\frac{3\sin(3x)}{16(a+bx)}+\frac{\sin(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^2}$$
$$= \frac{\operatorname{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^2}+\frac{\operatorname{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^2}+\frac{3\operatorname{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx, x\right.}{16c^2}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^2}+\frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^2}$$
$$= -\frac{\operatorname{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^2}-\frac{3\operatorname{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16bc^2}-\frac{\operatorname{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)\sin\left(\frac{5a}{b}\right.}{16bc^2}$$

Mathematica [A] time = 0.494237, size = 136, normalized size = 0.74

$$\frac{-2\sin\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-3\sin\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-\sin\left(\frac{5a}{b}\right)\operatorname{CosIntegral}\left(5\left(\frac{a}{b}+\right.\right.}{16bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] - CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + 2*
Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*SinIntegral[3*(a/b
 + ArcSin[c*x])] + Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*c
^2)
```

Maple [A] time = 0.046, size = 139, normalized size = 0.8

$$\frac{1}{16\,c^2b}\left(3\operatorname{Si}\left(3\arcsin(cx)+3\frac{a}{b}\right)\cos\left(3\frac{a}{b}\right)-3\operatorname{Ci}\left(3\arcsin(cx)+3\frac{a}{b}\right)\sin\left(3\frac{a}{b}\right)+2\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/16/c^2*(3*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-3*Ci(3*arcsin(c*x)+3*a/b)*si
n(3*a/b)+2*Si(arcsin(c*x)+a/b)*cos(a/b)-2*Ci(arcsin(c*x)+a/b)*sin(a/b)+Si(5
```

```
*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}x}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(c^2x^3-x\right)\sqrt{-c^2x^2+1}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^3 - x)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{a+b\,\mathrm{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [B] time = 1.42302, size = 486, normalized size = 2.66

$$-\frac{\cos\left(\frac{a}{b}\right)^4\,\mathrm{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^2}+\frac{\cos\left(\frac{a}{b}\right)^5\,\mathrm{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{bc^2}+\frac{3\cos\left(\frac{a}{b}\right)^2\,\mathrm{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^5*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^2) + 3/4*cos(a/b)^2*cos_integra
l(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) - 3/4*cos(a/b)^2*cos_integral(3*a
```

```
/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/4*cos(a/b)^3*sin_integral(5*a/b +
5*arcsin(c*x))/(b*c^2) + 3/4*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))
/(b*c^2) - 1/16*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) + 3/16
*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 1/8*cos_integral(a/
b + arcsin(c*x))*sin(a/b)/(b*c^2) + 5/16*cos(a/b)*sin_integral(5*a/b + 5*ar
csin(c*x))/(b*c^2) - 9/16*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c
^2) + 1/8*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

3.328 $\int \frac{(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=144

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\sin^{-1}(cx))}{b}\right)}{2bc}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\sin^{-1}(cx))}{b}\right)}{8bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\sin^{-1}(cx))}{b}\right)}{2bc}+\frac{\sin\left(\frac{4a}{b}\right)}{}$$

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c) + (Cos[(4*a)/
b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c) + (3*Log[a + b*ArcSin[c*
x]])/(8*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c
) + (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c)
```

Rubi [A] time = 0.242156, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4661, 3312, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}+$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b*c) + (Cos[(4*a)/b]
*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b*c) + (3*Log[a + b*ArcSin[c*x]])
/(8*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b*c) + (S
in[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b*c)
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^4(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{3}{8(a+bx)}+\frac{\cos(2x)}{2(a+bx)}+\frac{\cos(4x)}{8(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc}+\frac{\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx\right.}{2c}$$
$$= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c}+\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int\right.}{}$$
$$= \frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}+\frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc}+\frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc}+$$

Mathematica [A] time = 0.323578, size = 121, normalized size = 0.84

$$\frac{4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+4\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\sin^{-1}(\right.\right.}{8bc}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Cos[(4*a)/b]*CosIntegr
al[4*(a/b + ArcSin[c*x])] + 4*Log[a + b*ArcSin[c*x]] - Log[8*(a + b*ArcSin[
c*x])] + 4*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + Sin[(4*a)/b]*S
inIntegral[4*(a/b + ArcSin[c*x])])/(8*b*c)
```

Maple [A] time = 0.043, size = 135, normalized size = 0.9

$$\frac{1}{8\,cb}\text{Si}\left(4\,\arcsin(cx)+4\,\frac{a}{b}\right)\sin\left(4\,\frac{a}{b}\right)+\frac{1}{8\,cb}\text{Ci}\left(4\,\arcsin(cx)+4\,\frac{a}{b}\right)\cos\left(4\,\frac{a}{b}\right)+\frac{1}{2\,cb}\text{Si}\left(2\,\arcsin(cx)+2\,\frac{a}{b}\right)\sin\left(2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/8/c/b*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+1/8/c/b*Ci(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)+1/2/c/b*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+1/2/c/b*Ci(2*arcsin(c
*x)+2*a/b)*cos(2*a/b)+3/8*ln(a+b*arcsin(c*x))/b/c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{a+b\operatorname{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [A] time = 1.40511, size = 340, normalized size = 2.36

$$\frac{\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc}+\frac{\cos\left(\frac{a}{b}\right)^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc}-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc}+\frac{\cos\left(\frac{a}{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c) + cos(a/b)^3*sin(a/b)*
sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) - cos(a/b)^2*cos_integral(4*a/b +
 4*arcsin(c*x))/(b*c) + cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c
) - 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) + cos(a
/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c) + 1/8*cos_integral(4
*a/b + 4*arcsin(c*x))/(b*c) - 1/2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c)
 + 3/8*log(b*arcsin(c*x) + a)/(b*c)
```

3.329 $\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=139

$$\text{Unintegrable}\left(\frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)+\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b}+\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+}{}\right.}{4b}$$

```
[Out] (5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b) + (CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b) - (5*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(4*b) - (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(4*b) + Unintegrable[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.752415, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (5*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(4*b) + (CosIntegral[(3*a)/b +
3*ArcSin[c*x]]*Sin[(3*a)/b])/(4*b) - (5*Cos[a/b]*SinIntegral[a/b + ArcSin[c
*x]])/(4*b) - (Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(4*b) + D
efer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx &= \int \left(\frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}-\frac{2c^2x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}+\frac{c^4x^3}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}\right. \\
&= -\left(\left(2c^2\right)\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx\right)+c^4\int \frac{x^3}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx+\int \frac{}{x} \\
&= -\left(2\,\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)\right)+\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx+\text{Subst}\left(\int\right. \\
&= -\left(\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)\right)+\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+\right.}{a+bx}\right. \\
&= \frac{2\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b}-\frac{1}{4}\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx,x,\text{si}\right. \\
&= \frac{2\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b}+\frac{1}{4}\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin}{a}\right. \\
&= \frac{5\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{4b}+\frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{4b}-\frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b}
\end{aligned}$$

Mathematica [A] time = 2.91594, size = 0, normalized size = 0.

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.268, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin\left(cx\right)\right)}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{bx\arcsin\left(cx\right)+ax},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x*arcsin(c*x) + a*x), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x), x)
```

3.330 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=106

$$\text{Unintegrable}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)-\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2b}-\frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right.}{2b}$$

```
[Out] -(c*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b) - (3*c*Log[a
 + b*ArcSin[c*x]])/(2*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x
]))/b])/(2*b) + Unintegrable[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),
 x]
```

Rubi [A] time = 0.576431, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -(c*Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b) - (3*c*Log[a +
 b*ArcSin[c*x]])/(2*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x
]])/(2*b) + Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(1-c^2x^2\right)^{3/2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx &= \int \left(-\frac{2c^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}+\frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}+\frac{c^4x^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(\right.}\right.\\
&= -\left(\left(2c^2\right)\int \frac{1}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx\right)+c^4\int \frac{x^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx+\int \frac{}{x^2\sqrt{}}\\
&= -\frac{2c\log\left(a+b\sin^{-1}(cx)\right)}{b}+c\,\text{Subst}\left(\int \frac{\sin^2(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)+\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin\right.}\\
&= -\frac{2c\log\left(a+b\sin^{-1}(cx)\right)}{b}+c\,\text{Subst}\left(\int \left(\frac{1}{2(a+bx)}-\frac{\cos(2x)}{2(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)+\int \frac{}{x^2\sqrt{}}\\
&= -\frac{3c\log\left(a+b\sin^{-1}(cx)\right)}{2b}-\frac{1}{2}c\,\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)+\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\right.}\\
&= -\frac{3c\log\left(a+b\sin^{-1}(cx)\right)}{2b}-\frac{1}{2}\left(c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)-\frac{1}{2}\left(c\right.\\
&= -\frac{c\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2b}-\frac{3c\log\left(a+b\sin^{-1}(cx)\right)}{2b}-\frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right.}{2b}
\end{aligned}$$

Mathematica [A] time = 1.15088, size = 0, normalized size = 0.

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])),x]

[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.273, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin\left(cx\right)\right)}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x)

[Out] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{bx^2\arcsin\left(cx\right)+ax^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x^2\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**2/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**2*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{(b\arcsin{(cx)}+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^2), x)
```

3.331 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.13897, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 5.20636, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 2.187, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{(b\arcsin(cx)+a)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{bx^3\arcsin(cx)+ax^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^3*arcsin(c*x) + a*x^3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-(cx-1)(cx+1)\right)^{\frac{3}{2}}}{x^3\left(a+b\operatorname{asin}(cx)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**3/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**3*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{(b\arcsin(cx)+a)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^3), x)
```

3.332 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.139874, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.758061, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])),x]

[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 3.401, size = 0, normalized size = 0.

$$\int \frac{1}{x^4\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{(b \arcsin{(cx)}+a)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{bx^4 \arcsin{(cx)}+ax^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^4*arcsin(c*x) + a*x^4), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-(cx-1)(cx+1)\right)^{\frac{3}{2}}}{x^4\left(a+b \operatorname{asin}{(cx)}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**4/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**4*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{(b \arcsin{(cx)}+a)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^4), x)
```

3.333 $\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=245

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{128bc^4}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{32bc^4}+\frac{3\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\sin^{-1}(c}{b}\right.}{256bc^4}$$

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(128*b*c^4) - (CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(32*b*c^4) + (3*CosIntegral[(7*(a
 + b*ArcSin[c*x]))/b]*Sin[(7*a)/b])/(256*b*c^4) + (CosIntegral[(9*(a + b*Ar
cSin[c*x]))/b]*Sin[(9*a)/b])/(256*b*c^4) + (3*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(128*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*
x]))/b])/(32*b*c^4) - (3*Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b
])/(256*b*c^4) - (Cos[(9*a)/b]*SinIntegral[(9*(a + b*ArcSin[c*x]))/b])/(256
*b*c^4)
```

Rubi [A] time = 0.511682, antiderivative size = 241, normalized size of antiderivative = 0.98, number of steps used = 15, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{128bc^4}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{32bc^4}+\frac{3\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7a}{b}+7\right.}{256bc^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(128*b*c^4) - (CosIntegral[(3*
a)/b + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(32*b*c^4) + (3*CosIntegral[(7*a)/b + 7
*ArcSin[c*x]]*Sin[(7*a)/b])/(256*b*c^4) + (CosIntegral[(9*a)/b + 9*ArcSin[c
*x]]*Sin[(9*a)/b])/(256*b*c^4) + (3*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]]
)/(128*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(32*b*c
^4) - (3*Cos[(7*a)/b]*SinIntegral[(7*a)/b + 7*ArcSin[c*x]])/(256*b*c^4) - (
Cos[(9*a)/b]*SinIntegral[(9*a)/b + 9*ArcSin[c*x]])/(256*b*c^4)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^6(x)\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^4}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{128(a+bx)}+\frac{\sin(3x)}{32(a+bx)}-\frac{3\sin(7x)}{256(a+bx)}-\frac{\sin(9x)}{256(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^4}$$

$$= -\frac{\text{Subst}\left(\int \frac{\sin(9x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{256c^4} - \frac{3\,\text{Subst}\left(\int \frac{\sin(7x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{256c^4} + \frac{3\,\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x,\right.}{128c^4}$$

$$= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{128c^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^4} -$$

$$= -\frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{128bc^4} - \frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{32bc^4} + \frac{3\text{Ci}\left(\frac{7a}{b}+7\sin^{-1}(cx)\right)\sin\left(\frac{7a}{b}\right)}{256bc^4}$$

Mathematica [A] time = 1.13601, size = 180, normalized size = 0.73

$$\frac{-6\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-8\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+3\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(7\left(\frac{a}{b}+\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-6*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 8*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] + 3*CosIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] +
CosIntegral[9*(a/b + ArcSin[c*x])]*Sin[(9*a)/b] + 6*Cos[a/b]*SinIntegral[a/
b + ArcSin[c*x]] + 8*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 3*Co
s[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] - Cos[(9*a)/b]*SinIntegral[9*
(a/b + ArcSin[c*x])])/(256*b*c^4)
```

Maple [A] time = 0.054, size = 185, normalized size = 0.8

$$-\frac{1}{256\,c^4b}\left(3\,\text{Si}\left(7\,\arcsin(cx)+7\,\frac{a}{b}\right)\cos\left(7\,\frac{a}{b}\right)-3\,\text{Ci}\left(7\,\arcsin(cx)+7\,\frac{a}{b}\right)\sin\left(7\,\frac{a}{b}\right)-\text{Ci}\left(9\,\arcsin(cx)+9\,\frac{a}{b}\right)\sin\left(9\,\frac{a}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] -1/256/c^4*(3*Si(7*arcsin(c*x)+7*a/b)*cos(7*a/b)-3*Ci(7*arcsin(c*x)+7*a/b)*
sin(7*a/b)-Ci(9*arcsin(c*x)+9*a/b)*sin(9*a/b)-8*Si(3*arcsin(c*x)+3*a/b)*cos
(3*a/b)+8*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)+6*Ci(arcsin(c*x)+a/b)*sin(a/b)
+Si(9*arcsin(c*x)+9*a/b)*cos(9*a/b)-6*Si(arcsin(c*x)+a/b)*cos(a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}x^3}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^3/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^7-2\,c^2x^5+x^3\right)\sqrt{-c^2x^2+1}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^7 - 2*c^2*x^5 + x^3)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a)
, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.45036, size = 1007, normalized size = 4.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^8*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^
9*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) - 7/4*cos(a/b)^6*cos_integral
(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) + 3/4*cos(a/b)^6*cos_integral(7*a/
b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 9/4*cos(a/b)^7*sin_integral(9*a/b + 9
*arcsin(c*x))/(b*c^4) - 3/4*cos(a/b)^7*sin_integral(7*a/b + 7*arcsin(c*x))/
(b*c^4) + 15/16*cos(a/b)^4*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*
c^4) - 15/16*cos(a/b)^4*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4
) - 27/16*cos(a/b)^5*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) + 21/16*co
s(a/b)^5*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 5/32*cos(a/b)^2*cos_
integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) + 9/32*cos(a/b)^2*cos_inte
gral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/8*cos(a/b)^2*cos_integral(
3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) + 15/32*cos(a/b)^3*sin_integral(9*a
/b + 9*arcsin(c*x))/(b*c^4) - 21/32*cos(a/b)^3*sin_integral(7*a/b + 7*arcsi
n(c*x))/(b*c^4) + 1/8*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4
) + 1/256*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/256*cos_
integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 1/32*cos_integral(3*a/b
+ 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/128*cos_integral(a/b + arcsin(c*x))*s
in(a/b)/(b*c^4) - 9/256*cos(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4
) + 21/256*cos(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 3/32*cos(
a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 3/128*cos(a/b)*sin_integ
ral(a/b + arcsin(c*x))/(b*c^4)
```

3.334 $\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=268

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\sin^{-1}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\sin^{-1}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\sin^{-1}(cx}{b}\right.}{32bc^3}$$

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(4*
a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(6*a)/b]*Co
sIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(8*a)/b]*CosIntegra
l[(8*(a + b*ArcSin[c*x]))/b])/(128*b*c^3) + (5*Log[a + b*ArcSin[c*x]])/(128
*b*c^3) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3)
- (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Sin[(
6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Sin[(8*a)/b]*
SinIntegral[(8*(a + b*ArcSin[c*x]))/b])/(128*b*c^3)
```

Rubi [A] time = 0.529588, antiderivative size = 268, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 4406, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{32bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6a}{b}+6\right.}{32bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c^3) - (Cos[(4*a)
/b]*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(32*b*c^3) - (Cos[(6*a)/b]*CosInt
egral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c^3) - (Cos[(8*a)/b]*CosIntegral[(8*a
)/b + 8*ArcSin[c*x]])/(128*b*c^3) + (5*Log[a + b*ArcSin[c*x]])/(128*b*c^3)
+ (Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c^3) - (Sin[(4*
a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(32*b*c^3) - (Sin[(6*a)/b]*SinI
ntegral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c^3) - (Sin[(8*a)/b]*SinIntegral[(8
*a)/b + 8*ArcSin[c*x]])/(128*b*c^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^2\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^6(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{5}{128(a+bx)}+\frac{\cos(2x)}{32(a+bx)}-\frac{\cos(4x)}{32(a+bx)}-\frac{\cos(6x)}{32(a+bx)}-\frac{\cos(8x)}{128(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{128bc^3} - \frac{\text{Subst}\left(\int \frac{\cos(8x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{128c^3} + \frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3} -$$

$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{128bc^3} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos(}{a}\right.}{32}$$

$$= \frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}+6\sin^{-1}(cx)\right)}{32bc^3}$$

Mathematica [A] time = 1.03006, size = 209, normalized size = 0.78

$$-\frac{-4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+4\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+4\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -(-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 4*Cos[(4*a)/b]*CosIn
tegral[4*(a/b + ArcSin[c*x])] + 4*Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[
c*x])] + Cos[(8*a)/b]*CosIntegral[8*(a/b + ArcSin[c*x])] + 11*Log[a + b*Arc
Sin[c*x]] - 16*Log[8*(a + b*ArcSin[c*x])] - 4*Sin[(2*a)/b]*SinIntegral[2*(a
/b + ArcSin[c*x])] + 4*Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] + 4*
Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + Sin[(8*a)/b]*SinIntegral[
8*(a/b + ArcSin[c*x])])/(128*b*c^3)
```

Maple [A] time = 0.055, size = 251, normalized size = 0.9

$$-\frac{1}{32\,bc^3}\text{Si}\left(6\,\arcsin(cx)+6\,\frac{a}{b}\right)\sin\left(6\,\frac{a}{b}\right)-\frac{1}{32\,bc^3}\text{Ci}\left(6\,\arcsin(cx)+6\,\frac{a}{b}\right)\cos\left(6\,\frac{a}{b}\right)-\frac{1}{32\,bc^3}\text{Si}\left(4\,\arcsin(cx)+4\,\frac{a}{b}\right)\text{si}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] -1/32/c^3/b*Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)-1/32/c^3/b*Ci(6*arcsin(c*x)+
6*a/b)*cos(6*a/b)-1/32/c^3/b*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)-1/32/c^3/b*
Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b)+1/32/c^3/b*Si(2*arcsin(c*x)+2*a/b)*sin(2
*a/b)-1/128/c^3/b*Si(8*arcsin(c*x)+8*a/b)*sin(8*a/b)-1/128/c^3/b*Ci(8*arcsi
n(c*x)+8*a/b)*cos(8*a/b)+1/32/c^3/b*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)+5/12
8*ln(a+b*arcsin(c*x))/b/c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}x^2}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^2/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\left(c^4x^6-2\,c^2x^4+x^2\right)\sqrt{-c^2x^2+1}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^6 - 2*c^2*x^4 + x^2)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a)
, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.39237, size = 1022, normalized size = 3.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^8*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) - cos(a/b)^7*sin(a/
b)*sin_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 2*cos(a/b)^6*cos_integral(
8*a/b + 8*arcsin(c*x))/(b*c^3) - cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c
*x))/(b*c^3) + 3/2*cos(a/b)^5*sin(a/b)*sin_integral(8*a/b + 8*arcsin(c*x))/
(b*c^3) - cos(a/b)^5*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) -
 5/4*cos(a/b)^4*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 3/2*cos(a/b)^
4*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/4*cos(a/b)^4*cos_integral
(4*a/b + 4*arcsin(c*x))/(b*c^3) - 5/8*cos(a/b)^3*sin(a/b)*sin_integral(8*a/
b + 8*arcsin(c*x))/(b*c^3) + cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arc
sin(c*x))/(b*c^3) - 1/4*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c
*x))/(b*c^3) + 1/4*cos(a/b)^2*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) -
 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/4*cos(a/b)
^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)^2*cos_integr
al(2*a/b + 2*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(8*a
/b + 8*arcsin(c*x))/(b*c^3) - 3/16*cos(a/b)*sin(a/b)*sin_integral(6*a/b + 6
*arcsin(c*x))/(b*c^3) + 1/8*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin
(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))
/(b*c^3) - 1/128*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 1/32*cos_int
egral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/32*cos_integral(4*a/b + 4*arcsin(c
*x))/(b*c^3) - 1/32*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) + 5/128*log
(b*arcsin(c*x) + a)/(b*c^3)
```

3.335 $\int \frac{x(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=245

$$-\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{64bc^2}-\frac{9\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{64bc^2}-\frac{5\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\sin^{-1}}{b}\right.}{64bc^2}$$

```
[Out] (-5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(64*b*c^2) - (9*CosIntegra
l[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(64*b*c^2) - (5*CosIntegral[(5*(
a + b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(64*b*c^2) - (CosIntegral[(7*(a + b*Ar
cSin[c*x]))/b]*Sin[(7*a)/b])/(64*b*c^2) + (5*Cos[a/b]*SinIntegral[(a + b*Ar
cSin[c*x])/b])/(64*b*c^2) + (9*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*
x]))/b])/(64*b*c^2) + (5*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(64*b*c^2) + (Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b
*c^2)
```

Rubi [A] time = 0.447002, antiderivative size = 241, normalized size of antiderivative = 0.98, number of steps used = 15, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4723, 4406, 3303, 3299, 3302}

$$-\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64bc^2}-\frac{9\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{64bc^2}-\frac{5\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+\right.}{64bc^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(64*b*c^2) - (9*CosIntegral[(3
*a)/b + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(64*b*c^2) - (5*CosIntegral[(5*a)/b +
5*ArcSin[c*x]]*Sin[(5*a)/b])/(64*b*c^2) - (CosIntegral[(7*a)/b + 7*ArcSin[c
*x]]*Sin[(7*a)/b])/(64*b*c^2) + (5*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])
/(64*b*c^2) + (9*Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(64*b*c
^2) + (5*Cos[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(64*b*c^2) + (C
os[(7*a)/b]*SinIntegral[(7*a)/b + 7*ArcSin[c*x]])/(64*b*c^2)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^6(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^2}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{5\sin(x)}{64(a+bx)} + \frac{9\sin(3x)}{64(a+bx)} + \frac{5\sin(5x)}{64(a+bx)} + \frac{\sin(7x)}{64(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^2}$$

$$= \frac{\text{Subst}\left(\int \frac{\sin(7x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^2} + \frac{5\,\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^2} + \frac{5\,\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x,\right.}{64c^2}$$

$$= \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^2} + \frac{\left(9\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \sin^{-1}(cx\right.}{64c^2}$$

$$= -\frac{5\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^2} - \frac{9\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{64bc^2} - \frac{5\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)\sin\left(\frac{5a}{b}\right.}{64bc^2}$$

Mathematica [A] time = 0.914393, size = 180, normalized size = 0.73

$$-5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) - 9\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) - 5\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{s}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 9*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] - 5*CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] -
CosIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] + 5*Cos[a/b]*SinIntegral[a/
b + ArcSin[c*x]] + 9*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*Co
s[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + Cos[(7*a)/b]*SinIntegral[7*
(a/b + ArcSin[c*x])])/(64*b*c^2)
```

Maple [A] time = 0.048, size = 185, normalized size = 0.8

$$\frac{1}{64\,c^2b}\left(9\,\text{Si}\left(3\,\arcsin(cx)+3\,\frac{a}{b}\right)\cos\left(3\,\frac{a}{b}\right) - 9\,\text{Ci}\left(3\,\arcsin(cx)+3\,\frac{a}{b}\right)\sin\left(3\,\frac{a}{b}\right) + 5\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right) - 5\,\text{C}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/64/c^2*(9*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-9*Ci(3*arcsin(c*x)+3*a/b)*si
n(3*a/b)+5*Si(arcsin(c*x)+a/b)*cos(a/b)-5*Ci(arcsin(c*x)+a/b)*sin(a/b)+Si(7
*arcsin(c*x)+7*a/b)*cos(7*a/b)-Ci(7*arcsin(c*x)+7*a/b)*sin(7*a/b)+5*Si(5*ar
csin(c*x)+5*a/b)*cos(5*a/b)-5*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}x}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^5-2\,c^2x^3+x\right)\sqrt{-c^2x^2+1}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^5 - 2*c^2*x^3 + x)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a),
x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.4237, size = 829, normalized size = 3.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^6*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^7*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^2) + 5/4*cos(a/b)^4*cos_integra
l(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/4*cos(a/b)^4*cos_integral(5*a
/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) - 7/4*cos(a/b)^5*sin_integral(7*a/b +
7*arcsin(c*x))/(b*c^2) + 5/4*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))
/(b*c^2) - 3/8*cos(a/b)^2*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c
^2) + 15/16*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2)
 - 9/16*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) + 7
/8*cos(a/b)^3*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^2) - 25/16*cos(a/b)^
3*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^2) + 9/16*cos(a/b)^3*sin_integra
l(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/64*cos_integral(7*a/b + 7*arcsin(c*x))
*sin(a/b)/(b*c^2) - 5/64*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^
2) + 9/64*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/64*cos_i
ntegral(a/b + arcsin(c*x))*sin(a/b)/(b*c^2) - 7/64*cos(a/b)*sin_integral(7*
a/b + 7*arcsin(c*x))/(b*c^2) + 25/64*cos(a/b)*sin_integral(5*a/b + 5*arcsin
(c*x))/(b*c^2) - 27/64*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2)
 + 5/64*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

3.336 $\int \frac{(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=206

$$\frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\sin^{-1}(cx))}{b}\right)}{32bc}+\frac{3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\sin^{-1}(cx))}{b}\right)}{16bc}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\sin^{-1}(cx))}{b}\right)}{32bc}$$

```
[Out] (15*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c) + (3*Cos[
(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c) + (Cos[(6*a)/b]*C
osIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c) + (5*Log[a + b*ArcSin[c*x]]
)/(16*b*c) + (15*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b
*c) + (3*Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c) + (S
in[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c)
```

Rubi [A] time = 0.320551, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4661, 3312, 3303, 3299, 3302}

$$\frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc}+\frac{3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6a}{b}\right.}{32bc}$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c) + (3*Cos[(4
*a)/b]*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(16*b*c) + (Cos[(6*a)/b]*CosIn
tegral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c) + (5*Log[a + b*ArcSin[c*x]])/(16*
b*c) + (15*Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(32*b*c) + (3
*Sin[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(16*b*c) + (Sin[(6*a)/b
]*SinIntegral[(6*a)/b + 6*ArcSin[c*x]])/(32*b*c)
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^6(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{5}{16(a+bx)}+\frac{15\cos(2x)}{32(a+bx)}+\frac{3\cos(4x)}{16(a+bx)}+\frac{\cos(6x)}{32(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{16bc}+\frac{\text{Subst}\left(\int \frac{\cos(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c}+\frac{3\,\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c}$$
$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{16bc}+\frac{\left(15\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c}+\frac{\left(3\cos\left(\frac{4a}{b}\right)\right)\text{Subs}}{}$$
$$= \frac{15\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc}+\frac{3\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc}+\frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}+6\sin^{-1}(\right.}{32bc}$$

Mathematica [A] time = 0.682498, size = 165, normalized size = 0.8

$$\frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+6\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(6\left(\frac{a}{b}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 6*Cos[(4*a)/b]*CosInt
egral[4*(a/b + ArcSin[c*x])] + Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[c*x
])] + 18*Log[a + b*ArcSin[c*x]] - 8*Log[8*(a + b*ArcSin[c*x])] + 15*Sin[(2*
a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 6*Sin[(4*a)/b]*SinIntegral[4*(a/
b + ArcSin[c*x])] + Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(32*b*
c)
```

Maple [A] time = 0.044, size = 193, normalized size = 0.9

$$\frac{15}{32\,cb}\text{Si}\left(2\arcsin(cx)+2\,\frac{a}{b}\right)\sin\left(2\,\frac{a}{b}\right)+\frac{15}{32\,cb}\text{Ci}\left(2\arcsin(cx)+2\,\frac{a}{b}\right)\cos\left(2\,\frac{a}{b}\right)+\frac{1}{32\,cb}\text{Si}\left(6\arcsin(cx)+6\,\frac{a}{b}\right)\sin\left(6\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] 15/32/c/b*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+15/32/c/b*Ci(2*arcsin(c*x)+2*a
/b)*cos(2*a/b)+1/32/c/b*Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+1/32/c/b*Ci(6*ar
```

```
csin(c*x)+6*a/b)*cos(6*a/b)+3/16/c/b*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+3/1
6/c/b*Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b)+5/16*ln(a+b*arcsin(c*x))/b/c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4-2\,c^2x^2+1\right)\sqrt{-c^2x^2+1}}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a),
x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.41033, size = 637, normalized size = 3.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) + cos(a/b)^5*sin(a/b)*
sin_integral(6*a/b + 6*arcsin(c*x))/(b*c) - 3/2*cos(a/b)^4*cos_integral(6*a
/b + 6*arcsin(c*x))/(b*c) + 3/2*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*
x))/(b*c) - cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c) +
```

```
 3/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) + 9/16*c
os(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) - 3/2*cos(a/b)^2*cos_in
tegral(4*a/b + 4*arcsin(c*x))/(b*c) + 15/16*cos(a/b)^2*cos_integral(2*a/b +
 2*arcsin(c*x))/(b*c) + 3/16*cos(a/b)*sin(a/b)*sin_integral(6*a/b + 6*arcsi
n(c*x))/(b*c) - 3/4*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(
b*c) + 15/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c) -
1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) + 3/16*cos_integral(4*a/b +
4*arcsin(c*x))/(b*c) - 15/32*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c) + 5/
16*log(b*arcsin(c*x) + a)/(b*c)
```

3.337 $\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=195

$$\text{Unintegrable}\left(\frac{1}{x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))},x\right)+\frac{11\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8b}+\frac{7\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3}{}\right.}{16b}$$

```
[Out] (11*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b) + (7*CosIntegral[(3*
(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b) + (CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b]*Sin[(5*a)/b])/(16*b) - (11*Cos[a/b]*SinIntegral[(a + b*ArcSin[c
*x])/b])/(8*b) - (7*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(1
6*b) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b) + Unint
egrable[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 1.14507, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\sin^{-1}(cx))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (11*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(8*b) + (7*CosIntegral[(3*a)/b
 + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(16*b) + (CosIntegral[(5*a)/b + 5*ArcSin[c*
x]]*Sin[(5*a)/b])/(16*b) - (11*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(8*
b) - (7*Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b) - (Cos[(5
*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b) + Defer[Int][1/(x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx = \int\left(\frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)} - \frac{3c^2x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)} + \frac{3c^4x^3}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\right.$$

$$= -\left(\left(3c^2\right)\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx\right) + \left(3c^4\right)\int \frac{x^3}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx - c^6\int$$

$$= -\left(3\,\mathrm{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)\right) + 3\,\mathrm{Subst}\left(\int \frac{\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right) + \int \frac{}{x\sqrt{1-c}}$$

$$= 3\,\mathrm{Subst}\left(\int\left(\frac{3\sin(x)}{4(a+bx)} - \frac{\sin(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right) - \left(3\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,d\right.$$

$$= \frac{3\mathrm{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{3\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b} - \frac{1}{16}\,\mathrm{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin\right.$$

$$= \frac{3\mathrm{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{3\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b} - \frac{1}{8}\left(5\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{a}{b}\right.}{a+b}\right.$$

$$= \frac{11\mathrm{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8b} + \frac{7\mathrm{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16b} + \frac{\mathrm{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)\sin\left(\right.}{16b}$$

Mathematica [A] time = 2.93012, size = 0, normalized size = 0.

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.323, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{\left(b\arcsin(cx)+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4 - 2\,c^2x^2 + 1\right)\sqrt{-c^2x^2 + 1}}{bx\arcsin\left(cx\right) + ax}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x*arcsin(c*x) + a*
x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2 + 1\right)^{\frac{5}{2}}}{\left(b\arcsin\left(cx\right) + a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x), x)
```

3.338 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\sin^{-1}(cx))} dx$

Optimal. Leaf size=160

$$\text{Unintegrable}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)-\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b}-\frac{c\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4}{-}\right.}{8b}$$

```
[Out] -((c*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/b) - (c*Cos[(4*a)
/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b) - (15*c*Log[a + b*ArcSin[
c*x]])/(8*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/b -
(c*Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b) + Unintegrabl
e[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.932534, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((c*Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/b) - (c*Cos[(4*a)/b
]*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b) - (15*c*Log[a + b*ArcSin[c*x]
])/(8*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/b - (c*Sin
[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b) + Defer[Int][1/(x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^2\left(a+b\sin^{-1}(cx)\right)}dx = \int \left(-\frac{3c^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)} + \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)} + \frac{3c^4x^2}{\sqrt{1-c^2x^2}\left(a+b\sin\right.}\right.$$

$$= -\left(\left(3c^2\right)\int \frac{1}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}dx\right) + \left(3c^4\right)\int \frac{x^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}dx - c$$

$$= -\frac{3c\log\left(a+b\sin^{-1}(cx)\right)}{b} - c\,\text{Subst}\left(\int \frac{\sin^4(x)}{a+bx}dx, x, \sin^{-1}(cx)\right) + (3c)\,\text{Subst}\left(\int \frac{\sin^2(x}{a+bx}\right.$$

$$= -\frac{3c\log\left(a+b\sin^{-1}(cx)\right)}{b} - c\,\text{Subst}\left(\int \left(\frac{3}{8(a+bx)} - \frac{\cos(2x)}{2(a+bx)} + \frac{\cos(4x)}{8(a+bx)}\right)dx, x, \sin^{-1}\right.$$

$$= -\frac{15c\log\left(a+b\sin^{-1}(cx)\right)}{8b} - \frac{1}{8}c\,\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}dx, x, \sin^{-1}(cx)\right) + \frac{1}{2}c\,\text{Subst}\left(\int \frac{\cos(}{a+}\right.$$

$$= -\frac{15c\log\left(a+b\sin^{-1}(cx)\right)}{8b} + \frac{1}{2}\left(c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}dx, x, \sin^{-1}(cx)\right) -$$

$$= -\frac{c\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b} - \frac{c\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8b} - \frac{15c\log\left(a+b\sin\right.}{8b}$$

Mathematica [A] time = 1.06526, size = 0, normalized size = 0.

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^2\left(a+b\sin^{-1}(cx)\right)}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.335, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{\frac{5}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{\left(b\arcsin(cx)+a\right)x^2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4 - 2\,c^2x^2 + 1\right)\sqrt{-c^2x^2 + 1}}{bx^2 \arcsin\left(cx\right) + ax^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^2*arcsin(c*x) +
a*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**2/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2 + 1\right)^{\frac{5}{2}}}{\left(b \arcsin\left(cx\right) + a\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^2), x)
```

3.339 $\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.142638, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 5.2262, size = 0, normalized size = 0.

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 2.24, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)
```

[Out] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{(b\arcsin{(cx)}+a)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^3), x)

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\left(c^4x^4-2\,c^2x^2+1\right)\sqrt{-c^2x^2+1}}{bx^3\arcsin{(cx)}+ax^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^3*arcsin(c*x) + a*x^3), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c**2*x**2+1)**(5/2)/x**3/(a+b*asin(c*x)),x)

[Out] Timed out

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{(b\arcsin{(cx)}+a)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^3), x)

3.340 $\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\left(1-c^2x^2\right)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.144791, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.848321, size = 0, normalized size = 0.

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])),x]

[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 3.553, size = 0, normalized size = 0.

$$\int \frac{1}{x^4\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{(b\arcsin\left(cx\right)+a)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4-2\,c^2x^2+1\right)\sqrt{-c^2x^2+1}}{bx^4\arcsin\left(cx\right)+ax^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^4*arcsin(c*x) +
a*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**4/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{(b\arcsin\left(cx\right)+a)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^4), x)
```

3.341 $\int \frac{x^4}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=41

$$-\frac{\text{CosIntegral}\left(2\sin^{-1}(ax)\right)}{2a^5}+\frac{\text{CosIntegral}\left(4\sin^{-1}(ax)\right)}{8a^5}+\frac{3\log\left(\sin^{-1}(ax)\right)}{8a^5}$$

```
[Out] -CosIntegral[2*ArcSin[a*x]]/(2*a^5) + CosIntegral[4*ArcSin[a*x]]/(8*a^5) +
(3*Log[ArcSin[a*x]])/(8*a^5)
```

Rubi [A] time = 0.158949, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4723, 3312, 3302}

$$-\frac{\text{CosIntegral}\left(2\sin^{-1}(ax)\right)}{2a^5}+\frac{\text{CosIntegral}\left(4\sin^{-1}(ax)\right)}{8a^5}+\frac{3\log\left(\sin^{-1}(ax)\right)}{8a^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -CosIntegral[2*ArcSin[a*x]]/(2*a^5) + CosIntegral[4*ArcSin[a*x]]/(8*a^5) +
(3*Log[ArcSin[a*x]])/(8*a^5)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^4(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a^5}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{3}{8x} - \frac{\cos(2x)}{2x} + \frac{\cos(4x)}{8x}\right)dx, x, \sin^{-1}(ax)\right)}{a^5}$$
$$= \frac{3\log\left(\sin^{-1}(ax)\right)}{8a^5} + \frac{\text{Subst}\left(\int \frac{\cos(4x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{8a^5} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{2a^5}$$
$$= -\frac{\text{Ci}\left(2\sin^{-1}(ax)\right)}{2a^5} + \frac{\text{Ci}\left(4\sin^{-1}(ax)\right)}{8a^5} + \frac{3\log\left(\sin^{-1}(ax)\right)}{8a^5}$$

Mathematica [A] time = 0.0718342, size = 31, normalized size = 0.76

$$\frac{-4\text{CosIntegral}\left(2\sin^{-1}(ax)\right) + \text{CosIntegral}\left(4\sin^{-1}(ax)\right) + 3\log\left(\sin^{-1}(ax)\right)}{8a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] (-4*CosIntegral[2*ArcSin[a*x]] + CosIntegral[4*ArcSin[a*x]] + 3*Log[ArcSin[
a*x]])/(8*a^5)
```

Maple [A] time = 0.055, size = 36, normalized size = 0.9

$$-\frac{\text{Ci}\left(2\arcsin(ax)\right)}{2a^5} + \frac{\text{Ci}\left(4\arcsin(ax)\right)}{8a^5} + \frac{3\ln\left(\arcsin(ax)\right)}{8a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^5+1/8*Ci(4*arcsin(a*x))/a^5+3/8*ln(arcsin(a*x))/a^
5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^4}{\left(a^2x^2-1\right)\arcsin(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^4/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**4/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 1.31518, size = 47, normalized size = 1.15

$$\frac{\operatorname{Ci}(4\arcsin(ax))}{8a^5} - \frac{\operatorname{Ci}(2\arcsin(ax))}{2a^5} + \frac{3\log(\arcsin(ax))}{8a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/8*cos_integral(4*arcsin(a*x))/a^5 - 1/2*cos_integral(2*arcsin(a*x))/a^5 +
 3/8*log(arcsin(a*x))/a^5
```

3.342 $\int \frac{x^3}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\frac{3\text{Si}\left(\sin^{-1}(ax)\right)}{4a^4}-\frac{\text{Si}\left(3\sin^{-1}(ax)\right)}{4a^4}$$

```
[Out] (3*SinIntegral[ArcSin[a*x]])/(4*a^4) - SinIntegral[3*ArcSin[a*x]]/(4*a^4)
```

Rubi [A] time = 0.145394, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4723, 3312, 3299}

$$\frac{3\text{Si}\left(\sin^{-1}(ax)\right)}{4a^4}-\frac{\text{Si}\left(3\sin^{-1}(ax)\right)}{4a^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] (3*SinIntegral[ArcSin[a*x]])/(4*a^4) - SinIntegral[3*ArcSin[a*x]]/(4*a^4)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin^3(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{a^4}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{4x}-\frac{\sin(3x)}{4x}\right)dx,x,\sin^{-1}(ax)\right)}{a^4}\\
&= -\frac{\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{4a^4}+\frac{3\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{4a^4}\\
&= \frac{3\text{Si}\left(\sin^{-1}(ax)\right)}{4a^4}-\frac{\text{Si}\left(3\sin^{-1}(ax)\right)}{4a^4}
\end{aligned}$$

Mathematica [A] time = 0.0604065, size = 24, normalized size = 0.89

$$\frac{3\text{Si}\left(\sin^{-1}(ax)\right) - \text{Si}\left(3\sin^{-1}(ax)\right)}{4a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] (3*SinIntegral[ArcSin[a*x]] - SinIntegral[3*ArcSin[a*x]])/(4*a^4)
```

Maple [A] time = 0.049, size = 21, normalized size = 0.8

$$-\frac{\text{Si}\left(3\arcsin\left(ax\right)\right) - 3\,\text{Si}\left(\arcsin\left(ax\right)\right)}{4\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/4*(Si(3*arcsin(a*x))-3*Si(arcsin(a*x)))/a^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-a^2x^2+1}\arcsin\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^3}{\left(a^2x^2-1\right)\arcsin\left(ax\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^3/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}\,\text{asin}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 1.35669, size = 31, normalized size = 1.15

$$-\frac{\mathrm{Si}\,(3\,\arcsin\,(ax))}{4\,a^4}+\frac{3\,\mathrm{Si}\,(\arcsin\,(ax))}{4\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/4*sin_integral(3*arcsin(a*x))/a^4 + 3/4*sin_integral(arcsin(a*x))/a^4
```

3.343 $\int \frac{x^2}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}-\frac{\text{CosIntegral}\left(2\sin^{-1}(ax)\right)}{2a^3}$$

```
[Out] -CosIntegral[2*ArcSin[a*x]]/(2*a^3) + Log[ArcSin[a*x]]/(2*a^3)
```

Rubi [A] time = 0.136286, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4723, 3312, 3302}

$$\frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}-\frac{\text{CosIntegral}\left(2\sin^{-1}(ax)\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -CosIntegral[2*ArcSin[a*x]]/(2*a^3) + Log[ArcSin[a*x]]/(2*a^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right)dx,x,\sin^{-1}(ax)\right)}{a^3}\\
&= \frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}-\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{2a^3}\\
&= -\frac{\text{Ci}\left(2\sin^{-1}(ax)\right)}{2a^3}+\frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}
\end{aligned}$$

Mathematica [A] time = 0.0580178, size = 22, normalized size = 0.81

$$\frac{\log \left(\sin ^{-1}(a x)\right)-\text{CosIntegral}\left(2 \sin ^{-1}(a x)\right)}{2 a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] (-CosIntegral[2*ArcSin[a*x]] + Log[ArcSin[a*x]])/(2*a^3)
```

Maple [A] time = 0.043, size = 24, normalized size = 0.9

$$-\frac{\text{Ci}\left(2 \arcsin \left(a x\right)\right)}{2\, a^{3}}+\frac{\ln \left(\arcsin \left(a x\right)\right)}{2\, a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^3+1/2*ln(arcsin(a*x))/a^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{\sqrt{-a^{2} x^{2}+1} \arcsin \left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left(-\frac{\sqrt{-a^{2} x^{2}+1} x^{2}}{{\left(a^{2} x^{2}-1\right)} \arcsin \left(a x\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{\sqrt{- \left(a x - 1\right) \left(a x + 1\right)} \operatorname{asin}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 1.31468, size = 31, normalized size = 1.15

$$-\frac{\operatorname{Ci}\left(2\arcsin\left(ax\right)\right)}{2\,a^{3}}+\frac{\log\left(\arcsin\left(ax\right)\right)}{2\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*cos_integral(2*arcsin(a*x))/a^3 + 1/2*log(arcsin(a*x))/a^3
```

3.344 $\int \frac{x^2}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}-\frac{\text{CosIntegral}\left(2\sin^{-1}(ax)\right)}{2a^3}$$

```
[Out] -CosIntegral[2*ArcSin[a*x]]/(2*a^3) + Log[ArcSin[a*x]]/(2*a^3)
```

Rubi [A] time = 0.134613, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4723, 3312, 3302}

$$\frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}-\frac{\text{CosIntegral}\left(2\sin^{-1}(ax)\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -CosIntegral[2*ArcSin[a*x]]/(2*a^3) + Log[ArcSin[a*x]]/(2*a^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right)dx,x,\sin^{-1}(ax)\right)}{a^3}\\
&= \frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}-\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{2a^3}\\
&= -\frac{\text{Ci}\left(2\sin^{-1}(ax)\right)}{2a^3}+\frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}
\end{aligned}$$

Mathematica [A] time = 0.0135606, size = 22, normalized size = 0.81

$$\frac{\log\left(\sin^{-1}(ax)\right) - \text{CosIntegral}\left(2\sin^{-1}(ax)\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] (-CosIntegral[2*ArcSin[a*x]] + Log[ArcSin[a*x]])/(2*a^3)
```

Maple [A] time = 0., size = 24, normalized size = 0.9

$$-\frac{\text{Ci}\,(2\arcsin\,(ax))}{2\,a^3} + \frac{\ln\,(\arcsin\,(ax))}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^3+1/2*ln(arcsin(a*x))/a^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-a^2x^2+1}\arcsin\,(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^2}{\left(a^2x^2-1\right)\arcsin\,(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-(ax-1)(ax+1)}\,\text{asin}\,(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 1.31592, size = 31, normalized size = 1.15

$$-\frac{\operatorname{Ci}\left(2 \arcsin\left(ax\right)\right)}{2 a^3}+\frac{\log\left(\arcsin\left(ax\right)\right)}{2 a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*cos_integral(2*arcsin(a*x))/a^3 + 1/2*log(arcsin(a*x))/a^3
```

3.345 $\int \frac{x}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=9

$$\frac{\text{Si}\left(\sin^{-1}(ax)\right)}{a^2}$$

```
[Out] SinIntegral[ArcSin[a*x]]/a^2
```

Rubi [A] time = 0.0750753, antiderivative size = 9, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4723, 3299}

$$\frac{\text{Si}\left(\sin^{-1}(ax)\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] SinIntegral[ArcSin[a*x]]/a^2
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a^2}\\ &= \frac{\text{Si}\left(\sin^{-1}(ax)\right)}{a^2}\end{aligned}$$

Mathematica [A] time = 0.0482187, size = 9, normalized size = 1.

$$\frac{\text{Si}\left(\sin^{-1}(ax)\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] SinIntegral[ArcSin[a*x]]/a^2
```

Maple [A] time = 0.037, size = 10, normalized size = 1.1

$$\frac{\mathrm{Si}\left(\arcsin\left(ax\right)\right)}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] Si(arcsin(a*x))/a^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-a^{2}x^{2}+1}\arcsin\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-a^{2}x^{2}+1}x}{\left(a^{2}x^{2}-1\right)\arcsin\left(ax\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}\operatorname{asin}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 1.37371, size = 12, normalized size = 1.33

$$\frac{\mathrm{Si}\left(\arcsin\left(ax\right)\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] sin_integral(arcsin(a*x))/a^2
```

3.346 $\int \frac{1}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=9

$$\frac{\log\left(\sin^{-1}(ax)\right)}{a}$$

```
[Out] Log[ArcSin[a*x]]/a
```

Rubi [A] time = 0.032975, antiderivative size = 9, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4639}

$$\frac{\log\left(\sin^{-1}(ax)\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Log[ArcSin[a*x]]/a
```

Rule 4639

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Symbol] :> Simp[Log[a + b*ArcSin[c*x]]/(b*c*Sqrt[d]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \frac{\log\left(\sin^{-1}(ax)\right)}{a}$$

Mathematica [A] time = 0.0185966, size = 9, normalized size = 1.

$$\frac{\log\left(\sin^{-1}(ax)\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Log[ArcSin[a*x]]/a
```

Maple [A] time = 0.003, size = 10, normalized size = 1.1

$$\frac{\ln\left(\arcsin\left(ax\right)\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)

[Out] ln(arcsin(a*x))/a
```

Maxima [A] time = 1.87578, size = 12, normalized size = 1.33

$$\frac{\log(\arcsin(ax))}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] log(arcsin(a*x))/a
```

Fricas [A] time = 1.85105, size = 28, normalized size = 3.11

$$\frac{\log(-\arcsin(ax))}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] log(-arcsin(a*x))/a
```

Sympy [A] time = 0.496362, size = 7, normalized size = 0.78

$$\frac{\log(\operatorname{asin}(ax))}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/asin(a*x)/(-a**2*x**2+1)**(1/2),x)

[Out] log(asin(a*x))/a
```

Giac [A] time = 1.2914, size = 14, normalized size = 1.56

$$\frac{\log(|\arcsin(ax)|)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] log(abs(arcsin(a*x)))/a
```

3.347 $\int \frac{1}{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{1}{x\sqrt{1-a^2x^2}\sin^{-1}(ax)},x\right)$$

```
[Out] Unintegrable[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi [A] time = 0.0888625, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Defer[Int][1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \int \frac{1}{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.18066, size = 0, normalized size = 0.

$$\int \frac{1}{x\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Integrate[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [A] time = 0.092, size = 0, normalized size = 0.

$$\int \frac{1}{x\arcsin(ax)}\frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a^2x^2+1}x \arcsin{(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}}{\left(a^2x^3-x\right)\arcsin{(ax)}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)/((a^2*x^3 - x)*arcsin(a*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\sqrt{-(ax-1)(ax+1)}\operatorname{asin}{(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a^2x^2+1}x \arcsin{(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)), x)
```

3.348 $\int \frac{1}{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{1}{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)},x\right)$$

```
[Out] Unintegrable[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi [A] time = 0.0923622, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Defer[Int][1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \int \frac{1}{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.107585, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Integrate[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [A] time = 0.134, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\arcsin(ax)}\frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a^2x^2+1}x^2 \arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}}{\left(a^2x^4-x^2\right)\arcsin(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)/((a^2*x^4 - x^2)*arcsin(a*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x**2*sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a^2x^2+1}x^2 \arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)), x)
```

3.349 $\int \frac{x^5}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=183

$$-\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8bc^6}+\frac{5\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^6}-\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16bc^6}$$

```
[Out] (-5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b*c^6) + (5*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^6) - (CosIntegral[(5*(a +
 b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^6) + (5*Cos[a/b]*SinIntegral[(a +
 b*ArcSin[c*x])/b])/(8*b*c^6) - (5*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSi
n[c*x]))/b])/(16*b*c^6) + (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))
/b])/(16*b*c^6)
```

Rubi [A] time = 0.37279, antiderivative size = 179, normalized size of antiderivative = 0.98, number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 3312, 3303, 3299, 3302}

$$-\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8bc^6}+\frac{5\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16bc^6}-\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+5\sin\right.}{16bc^6}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-5*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(8*b*c^6) + (5*CosIntegral[(3*
a)/b + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(16*b*c^6) - (CosIntegral[(5*a)/b + 5*A
rcSin[c*x]]*Sin[(5*a)/b])/(16*b*c^6) + (5*Cos[a/b]*SinIntegral[a/b + ArcSin
[c*x]])/(8*b*c^6) - (5*Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(
16*b*c^6) + (Cos[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b*c^6)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^5}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^5(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^6}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{5\sin(x)}{8(a+bx)} - \frac{5\sin(3x)}{16(a+bx)} + \frac{\sin(5x)}{16(a+bx)}\right) dx, x, \sin^{-1}(cx)\right)}{c^6}$$

$$= \frac{\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^6} - \frac{5\,\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^6} + \frac{5\,\text{Subst}}{}$$

$$= \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^6} - \frac{\left(5\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\right.}{16c^6}$$

$$= -\frac{5\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^6} + \frac{5\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16bc^6} - \frac{\text{Ci}\left(\frac{5a}{b}+5\sin\right.}{16b}$$

Mathematica [A] time = 0.319395, size = 136, normalized size = 0.74

$$-\frac{10\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) - 5\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) + \sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}\right.\right.}{16bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -(10*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 5*CosIntegral[3*(a/b + ArcSi
n[c*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] - 1
0*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 5*Cos[(3*a)/b]*SinIntegral[3*(a
/b + ArcSin[c*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b
*c^6)
```

Maple [A] time = 0.048, size = 139, normalized size = 0.8

$$\frac{1}{16\,c^6b}\left(\text{Si}\left(5\,\arcsin(cx)+5\,\frac{a}{b}\right)\cos\left(5\,\frac{a}{b}\right) - \text{Ci}\left(5\,\arcsin(cx)+5\,\frac{a}{b}\right)\sin\left(5\,\frac{a}{b}\right) - 5\,\text{Si}\left(3\,\arcsin(cx)+3\,\frac{a}{b}\right)\cos\left(3\,\frac{a}{b}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] 1/16/c^6*(Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*
a/b)-5*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)+5*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a
```

```
/b)+10*Si(arcsin(c*x)+a/b)*cos(a/b)-10*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5}{\sqrt{-c^2x^2+1}(b \arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^5/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^5}{ac^2x^2+\left(bc^2x^2-b\right)\arcsin(cx)-a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^5/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5}{\sqrt{-(cx-1)(cx+1)}(a+b \operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**5/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [B] time = 1.43218, size = 486, normalized size = 2.66

$$-\frac{\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^6}+\frac{\cos\left(\frac{a}{b}\right)^5 \operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{bc^6}+\frac{3\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^6) + cos(a/b)
^5*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^6) + 3/4*cos(a/b)^2*cos_integra
l(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^6) + 5/4*cos(a/b)^2*cos_integral(3*a
```

```
/b + 3*arcsin(c*x))*sin(a/b)/(b*c^6) - 5/4*cos(a/b)^3*sin_integral(5*a/b +
5*arcsin(c*x))/(b*c^6) - 5/4*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))
/(b*c^6) - 1/16*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^6) - 5/16
*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^6) - 5/8*cos_integral(a/
b + arcsin(c*x))*sin(a/b)/(b*c^6) + 5/16*cos(a/b)*sin_integral(5*a/b + 5*ar
csin(c*x))/(b*c^6) + 15/16*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*
c^6) + 5/8*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^6)
```

3.350 $\int \frac{x^4}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=144

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2bc^5}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{8bc^5}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2bc^5}+\frac{\sin\left(\frac{4a}{b}\right.}{}$$

```
[Out] -(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c^5) + (Cos[(4*
a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c^5) + (3*Log[a + b*ArcS
in[c*x]])/(8*b*c^5) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])
/(2*b*c^5) + (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c^5
)
```

Rubi [A] time = 0.330929, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 3312, 3303, 3299, 3302}

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^5}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^5}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^5}+$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -(Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b*c^5) + (Cos[(4*a)
/b]*CosIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b*c^5) + (3*Log[a + b*ArcSin[c
*x]])/(8*b*c^5) - (Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b*
c^5) + (Sin[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b*c^5)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^4}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^4(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^5}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{3}{8(a+bx)} - \frac{\cos(2x)}{2(a+bx)} + \frac{\cos(4x)}{8(a+bx)}\right) dx, x, \sin^{-1}(cx)\right)}{c^5}$$

$$= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc^5} + \frac{\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^5} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx\right.}{2c^5}$$

$$= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc^5} - \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c^5} + \frac{\cos\left(\frac{4a}{b}\right.}{}$$

$$= -\frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^5} + \frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^5} + \frac{3\log\left(a+b\,\text{s}\right.}{8bc^5}$$

Mathematica [A] time = 0.235287, size = 108, normalized size = 0.75

$$\frac{-4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-4\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\sin^{-1}\right.\right.}{8bc^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Cos[(4*a)/b]*CosInteg
ral[4*(a/b + ArcSin[c*x])] + 3*Log[a + b*ArcSin[c*x]] - 4*Sin[(2*a)/b]*SinI
ntegral[2*(a/b + ArcSin[c*x])] + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c
*x])])/(8*b*c^5)
```

Maple [A] time = 0.046, size = 135, normalized size = 0.9

$$\frac{1}{8c^5b}\text{Si}\left(4\arcsin(cx)+4\frac{a}{b}\right)\sin\left(4\frac{a}{b}\right)+\frac{1}{8c^5b}\text{Ci}\left(4\arcsin(cx)+4\frac{a}{b}\right)\cos\left(4\frac{a}{b}\right)-\frac{1}{2c^5b}\text{Si}\left(2\arcsin(cx)+2\frac{a}{b}\right)\sin$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] 1/8/c^5/b*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+1/8/c^5/b*Ci(4*arcsin(c*x)+4*a
/b)*cos(4*a/b)-1/2/c^5/b*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-1/2/c^5/b*Ci(2*
arcsin(c*x)+2*a/b)*cos(2*a/b)+3/8*ln(a+b*arcsin(c*x))/b/c^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-c^2x^2+1}(b\arcsin{(cx)}+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^4}{ac^2x^2+\left(bc^2x^2-b\right)\arcsin{(cx)}-a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^4/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**4/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A] time = 1.3879, size = 343, normalized size = 2.38

$$\frac{\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{bc^5}+\frac{\cos\left(\frac{a}{b}\right)^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{bc^5}-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{bc^5}-\cos\left(\frac{a}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + cos(a/b)^3*sin(a/b
)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) - cos(a/b)^2*cos_integral(4*a
/b + 4*arcsin(c*x))/(b*c^5) - cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x)
)/(b*c^5) - 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^
5) - cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^5) + 1/8*co
s_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + 1/2*cos_integral(2*a/b + 2*arcs
in(c*x))/(b*c^5) + 3/8*log(b*arcsin(c*x) + a)/(b*c^5)
```

3.351 $\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=121

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4bc^4}+\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{4bc^4}+\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4bc^4}-\frac{\cos\left(\frac{3a}{b}\right)\dots}{\dots}$$

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b*c^4) + (CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b*c^4) + (3*Cos[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(4*b*c^4) - (Cos[(3*a)/b]*SinIntegral[(3*(a + b*Ar
cSin[c*x]))/b])/(4*b*c^4)
```

Rubi [A] time = 0.309733, antiderivative size = 117, normalized size of antiderivative = 0.97, number of steps used = 9, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 3312, 3303, 3299, 3302}

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^4}+\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4bc^4}+\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^4}-\dots$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(4*b*c^4) + (CosIntegral[(3*a)
/b + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(4*b*c^4) + (3*Cos[a/b]*SinIntegral[a/b +
 ArcSin[c*x]])/(4*b*c^4) - (Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x
]])/(4*b*c^4)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^4}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{4(a+bx)} - \frac{\sin(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^4}$$

$$= -\frac{\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^4} + \frac{3\,\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^4}$$

$$= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^4} - \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, s\right.}{4c^4}$$

$$= -\frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^4} + \frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{4bc^4} + \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{si}\right.}{4bc^4}$$

Mathematica [A] time = 0.195662, size = 92, normalized size = 0.76

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+\cos}{4bc^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -(3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcSin[c
*x])]*Sin[(3*a)/b] - 3*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/
b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(4*b*c^4)
```

Maple [A] time = 0.043, size = 93, normalized size = 0.8

$$-\frac{1}{4c^4b}\left(\text{Si}\left(3\arcsin(cx)+3\frac{a}{b}\right)\cos\left(3\frac{a}{b}\right)-\text{Ci}\left(3\arcsin(cx)+3\frac{a}{b}\right)\sin\left(3\frac{a}{b}\right)-3\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)+3\,\text{Ci}\left(a\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] -1/4/c^4*(Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-Ci(3*arcsin(c*x)+3*a/b)*sin(3*
a/b)-3*Si(arcsin(c*x)+a/b)*cos(a/b)+3*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^3}{ac^2x^2+\left(bc^2x^2-b\right)\arcsin\left(cx\right)-a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^3}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A] time = 1.41057, size = 232, normalized size = 1.92

$$\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^4}-\frac{\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{bc^4}-\frac{\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4\,bc^4}-\frac{3\operatorname{Ci}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^
3*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) - 1/4*cos_integral(3*a/b + 3*
arcsin(c*x))*sin(a/b)/(b*c^4) - 3/4*cos_integral(a/b + arcsin(c*x))*sin(a/b
)/(b*c^4) + 3/4*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 3/4*
cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^4)
```

3.352 $\int \frac{x^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=82

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2bc^3}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2bc^3}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3}$$

```
[Out] -(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c^3) + Log[a + 
b*ArcSin[c*x]]/(2*b*c^3) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x])
)/b])/(2*b*c^3)
```

Rubi [A] time = 0.250137, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4723, 3312, 3303, 3299, 3302}

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^3}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^3}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -(Cos[(2*a)/b]*CosIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b*c^3) + Log[a + b*
ArcSin[c*x]]/(2*b*c^3) - (Sin[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]]
)/(2*b*c^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}dx = \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{a+bx}dx, x, \sin^{-1}(cx)\right)}{c^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{2(a+bx)}-\frac{\cos(2x)}{2(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^3}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}dx, x, \sin^{-1}(cx)\right)}{2c^3}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3} - \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}dx, x, \sin^{-1}(cx)\right)}{2c^3} - \frac{\sin\left(\frac{2a}{b}\right)\text{S}}{}$$
$$= -\frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^3} + \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin\right.}{2bc^3}$$

Mathematica [A] time = 0.157963, size = 64, normalized size = 0.78

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] - Log[a + b*ArcSin[c*x]]
+ Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(2*b*c^3)
```

Maple [A] time = 0.043, size = 77, normalized size = 0.9

$$-\frac{1}{2c^3b}\text{Si}\left(2\arcsin(cx)+2\frac{a}{b}\right)\sin\left(2\frac{a}{b}\right)-\frac{1}{2c^3b}\text{Ci}\left(2\arcsin(cx)+2\frac{a}{b}\right)\cos\left(2\frac{a}{b}\right)+\frac{\ln(a+b\arcsin(cx))}{2c^3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2/c^3/b*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-1/2/c^3/b*Ci(2*arcsin(c*x)+2*
a/b)*cos(2*a/b)+1/2*ln(a+b*arcsin(c*x))/b/c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^2}{ac^2x^2+\left(bc^2x^2-b\right)\arcsin\left(cx\right)-a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A] time = 1.31683, size = 140, normalized size = 1.71

$$-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc^3}-\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc^3}+\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{2bc^3}+\frac{\log\left(b\arcsin\left(cx\right)+a\right)}{2bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) - cos(a/b)*sin(a/b)
*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) + 1/2*cos_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^3) + 1/2*log(b*arcsin(c*x) + a)/(b*c^3)
```

3.353 $\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=54

$$\frac{\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc^2}-\frac{\sin\left(\frac{a}{b}\right)\mathrm{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc^2}$$

```
[Out] -((CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^2)) + (Cos[a/b]*SinInt
egral[(a + b*ArcSin[c*x])/b])/(b*c^2)
```

Rubi [A] time = 0.153913, antiderivative size = 50, normalized size of antiderivative = 0.93, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {4723, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{bc^2}-\frac{\sin\left(\frac{a}{b}\right)\mathrm{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{bc^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(b*c^2)) + (Cos[a/b]*SinIntegra
l[a/b + ArcSin[c*x]])/(b*c^2)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}dx = \frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}dx, x, \sin^{-1}(cx)\right)}{c^2}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}dx, x, \sin^{-1}(cx)\right)}{c^2} - \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}dx, x, \sin^{-1}(c$$
$$= -\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{bc^2}$$

Mathematica [A] time = 0.104999, size = 45, normalized size = 0.83

$$\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b]) + Cos[a/b]*SinIntegral[a/b + Ar
cSin[c*x]])/(b*c^2)
```

Maple [A] time = 0.039, size = 46, normalized size = 0.9

$$\frac{1}{c^2b}\left(\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] 1/c^2*(Si(arcsin(c*x)+a/b)*cos(a/b)-Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x}{ac^2x^2+\left(bc^2x^2-b\right)\arcsin(cx)-a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) - a
), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A] time = 1.42552, size = 68, normalized size = 1.26

$$-\frac{\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)*sin_integral(a
/b + arcsin(c*x))/(b*c^2)
```

3.354 $\int \frac{1}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=16

$$\frac{\log\left(a+b\sin^{-1}(cx)\right)}{bc}$$

```
[Out] Log[a + b*ArcSin[c*x]]/(b*c)
```

Rubi [A] time = 0.0480692, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.04, Rules used = {4639}

$$\frac{\log\left(a+b\sin^{-1}(cx)\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Log[a + b*ArcSin[c*x]]/(b*c)
```

Rule 4639

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[Log[a + b*ArcSin[c*x]]/(b*c*Sqrt[d]), x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \frac{\log\left(a+b\sin^{-1}(cx)\right)}{bc}$$

Mathematica [A] time = 0.047529, size = 16, normalized size = 1.

$$\frac{\log\left(a+b\sin^{-1}(cx)\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Log[a + b*ArcSin[c*x]]/(b*c)
```

Maple [A] time = 0.006, size = 17, normalized size = 1.1

$$\frac{\ln\left(a+b\arcsin(cx)\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] ln(a+b*arcsin(c*x))/b/c
```

Maxima [A] time = 1.50592, size = 22, normalized size = 1.38

$$\frac{\log \left(b \arcsin \left(cx\right) + a\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] log(b*arcsin(c*x) + a)/(b*c)
```

Fricas [A] time = 1.93635, size = 42, normalized size = 2.62

$$\frac{\log \left(-b \arcsin \left(cx\right) - a\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] log(-b*arcsin(c*x) - a)/(b*c)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [C] time = 1.3367, size = 43, normalized size = 2.69

$$\frac{\log \left(b^{2} \Im \left(\arcsin \left(cx\right)\right)^{2} + \left(b \Re \left(\arcsin \left(cx\right)\right) + a\right)^{2}\right)}{2 \, bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*log(b^2*imag_part(arcsin(c*x))^2 + (b*real_part(arcsin(c*x)) + a)^2)/(b
*c)
```

3.355 $\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.124329, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 2.65123, size = 0, normalized size = 0.

$$\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.117, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)}\frac{1}{\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{ac^2x^3-ax+\left(bc^2x^3-bx\right)\arcsin(cx)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^2*x^3 - a*x + (b*c^2*x^3 - b*x)*arcsin(c*
x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\sqrt{-(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x), x)
```

3.356 $\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.12777, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.068679, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.085, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)}\frac{1}{\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{ac^2x^4-ax^2+\left(bc^2x^4-bx^2\right)\arcsin(cx)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^2*x^4 - a*x^2 + (b*c^2*x^4 - b*x^2)*arcsi
n(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{-(cx-1)(cx+1)}(a+b\,\mathrm{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x**2*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x^2), x)
```

3.357 $\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.142157, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 3.71424, size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.281, size = 0, normalized size = 0.

$$\int \frac{x^2}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^2}{ac^4x^4-2\,ac^2x^2+\left(bc^4x^4-2\,bc^2x^2+b\right)\arcsin{(cx)}+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b
*c^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-(cx-1)(cx+1)\right)^{\frac{3}{2}}(a+b\operatorname{asin}{(cx)})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

3.358 $\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=28

$$\text{Unintegrable}\left(\frac{x}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))},x\right)$$

```
[Out] Unintegrable[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.100776, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A] time = 9.68256, size = 0, normalized size = 0.

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.202, size = 0, normalized size = 0.

$$\int \frac{x}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}\,x}{ac^4x^4-2\,ac^2x^2+\left(bc^4x^4-2\,bc^2x^2+b\right)\arcsin(cx)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c
^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(-(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\mathrm{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(x/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

3.359 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=27

$$\text{Unintegrable}\left(\frac{1}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))},x\right)$$

```
[Out] Unintegrable[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0469016, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx = \int \frac{1}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A] time = 0.0938126, size = 0, normalized size = 0.

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.142, size = 0, normalized size = 0.

$$\int \frac{1}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}}{ac^4x^4-2\,ac^2x^2+\left(bc^4x^4-2\,bc^2x^2+b\right)\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2
*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-(cx-1)(cx+1)\right)^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

3.360 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.133831, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 2.55949, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 1.931, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}}{ac^4x^5-2\,ac^2x^3+ax+\left(bc^4x^5-2\,bc^2x^3+bx\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^5 - 2*a*c^2*x^3 + a*x + (b*c^4*x^5 - 2
*b*c^2*x^3 + b*x)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x), x)
```

3.361 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.136276, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 1.8818, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.385, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}}{ac^4x^6-2\,ac^2x^4+ax^2+\left(bc^4x^6-2\,bc^2x^4+bx^2\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^6 - 2*a*c^2*x^4 + a*x^2 + (b*c^4*x^6 -
 2*b*c^2*x^4 + b*x^2)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\text{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x^2), x)
```

3.362 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^2}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.139793, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{x^2}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 4.27619, size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 1.955, size = 0, normalized size = 0.

$$\int \frac{x^2}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^2}{ac^6x^6-3\,ac^4x^4+3\,ac^2x^2+\left(bc^6x^6-3\,bc^4x^4+3\,bc^2x^2-b\right)\arcsin\left(cx\right)-a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (
b*c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

3.363 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=28

$$\text{Unintegrable}\left(\frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))},x\right)$$

```
[Out] Unintegrable[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0918417, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx = \int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A] time = 24.0426, size = 0, normalized size = 0.

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 1.76, size = 0, normalized size = 0.

$$\int \frac{x}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x}{ac^6x^6-3\,ac^4x^4+3\,ac^2x^2+\left(bc^6x^6-3\,bc^4x^4+3\,bc^2x^2-b\right)\arcsin\left(cx\right)-a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (b*
c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(x/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

3.364 $\int \frac{1}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=27

$$\text{Unintegrable}\left(\frac{1}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0470863, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.101746, size = 0, normalized size = 0.

$$\int \frac{1}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 1.447, size = 0, normalized size = 0.

$$\int \frac{1}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{ac^6x^6-3\,ac^4x^4+3\,ac^2x^2+\left(bc^6x^6-3\,bc^4x^4+3\,bc^2x^2-b\right)\arcsin\left(cx\right)-a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (b*c^
6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

3.365 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.135257, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 5.63947, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 4.153, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin(cx)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{ac^6x^7-3\,ac^4x^5+3\,ac^2x^3-ax+\left(bc^6x^7-3\,bc^4x^5+3\,bc^2x^3-bx\right)\arcsin(cx)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^7 - 3*a*c^4*x^5 + 3*a*c^2*x^3 - a*x +
 (b*c^6*x^7 - 3*b*c^4*x^5 + 3*b*c^2*x^3 - b*x)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}(cx)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin(cx)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x), x)
```

3.366 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

[Out] Unintegrable[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]

Rubi [A] time = 0.136025, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 5.74451, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]

[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]

Maple [A] time = 4.325, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)

```
[Out] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{ac^6x^8-3\,ac^4x^6+3\,ac^2x^4-ax^2+\left(bc^6x^8-3\,bc^4x^6+3\,bc^2x^4-bx^2\right)\arcsin{(cx)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^8 - 3*a*c^4*x^6 + 3*a*c^2*x^4 - a*x^2
 + (b*c^6*x^8 - 3*b*c^4*x^6 + 3*b*c^2*x^4 - b*x^2)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(-(cx-1)(cx+1)\right)^{\frac{5}{2}}(a+b\operatorname{asin}{(cx)})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x^2), x)
```

3.367 $\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\left(1-c^2x^2\right)^{5/2}x^m}{a+b\sin^{-1}(cx)},x\right)$$

```
[Out] Unintegrable[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]), x]
```

Rubi [A] time = 0.127981, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx=\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A] time = 0.904023, size = 0, normalized size = 0.

$$\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]), x]
```

Maple [A] time = 0.967, size = 0, normalized size = 0.

$$\int \frac{x^m}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}x^m}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^m/(b*arcsin(c*x) + a), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\left(c^4x^4-2\,c^2x^2+1\right)\sqrt{-c^2x^2+1}x^m}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) +
a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}x^m}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^m/(b*arcsin(c*x) + a), x)
```

3.368 $\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{(1-c^2x^2)^{3/2}x^m}{a+b\sin^{-1}(cx)},x\right)$$

```
[Out] Unintegrable[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]), x]
```

Rubi [A] time = 0.126817, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx = \int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A] time = 0.483877, size = 0, normalized size = 0.

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]), x]
```

Maple [A] time = 0.854, size = 0, normalized size = 0.

$$\int \frac{x^m}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}x^m}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^m/(b*arcsin(c*x) + a), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}x^m}{b\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{a+b\operatorname{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**m*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}x^m}{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^m/(b*arcsin(c*x) + a), x)
```

3.369 $\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\sqrt{1-c^2x^2}x^m}{a+b\sin^{-1}(cx)},x\right)$$

```
[Out] Unintegrable[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]), x]
```

Rubi [A] time = 0.113326, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] Defer[Int][(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \int \frac{x^m\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A] time = 0.0654036, size = 0, normalized size = 0.

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]), x]
```

Maple [A] time = 0.664, size = 0, normalized size = 0.

$$\int \frac{x^m}{a+b\arcsin(cx)}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}x^m}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^m}{b\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**m*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}x^m}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

3.370 $\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

[Out] Unintegrable[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]

Rubi [A] time = 0.119974, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]

Rubi steps

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.562313, size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]

[Out] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]

Maple [A] time = 0.2, size = 0, normalized size = 0.

$$\int \frac{x^m}{a+b\arcsin(cx)}\frac{1}{\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)

[Out] int(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^m}{ac^2x^2+\left(bc^2x^2-b\right)\arcsin(cx)-a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-(cx-1)(cx+1)}(a+b\,\text{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**m/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

3.371 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^m}{(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.139677, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{x^m}{(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 1.06465, size = 0, normalized size = 0.

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.435, size = 0, normalized size = 0.

$$\int \frac{x^m}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^m}{ac^4x^4-2\,ac^2x^2+\left(bc^4x^4-2\,bc^2x^2+b\right)\arcsin\left(cx\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b
*c^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

3.372 $\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.132232, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 1.61503, size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]

[Out] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.551, size = 0, normalized size = 0.

$$\int \frac{x^m}{a+b\arcsin(cx)}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^m}{ac^6x^6-3\,ac^4x^4+3\,ac^2x^2+\left(bc^6x^6-3\,bc^4x^4+3\,bc^2x^2-b\right)\arcsin(cx)-a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (
b*c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

3.373 $\int \frac{x^m}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{x^m}{\sqrt{1-a^2x^2}\sin^{-1}(ax)},x\right)$$

```
[Out] Unintegrable[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi [A] time = 0.0897566, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Defer[Int][x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \int \frac{x^m}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.384027, size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Integrate[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [A] time = 0.2, size = 0, normalized size = 0.

$$\int \frac{x^m}{\arcsin(ax)}\frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^m}{(a^2x^2-1)\arcsin(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

3.374 $\int \frac{\left(c-a^2cx^2\right)^3}{\sin^{-1}(ax)^2}\,dx$

Optimal. Leaf size=95

$$-\frac{c^3\left(1-a^2x^2\right)^{7/2}}{a\sin^{-1}(ax)}-\frac{35c^3\text{Si}\left(\sin^{-1}(ax)\right)}{64a}-\frac{63c^3\text{Si}\left(3\sin^{-1}(ax)\right)}{64a}-\frac{35c^3\text{Si}\left(5\sin^{-1}(ax)\right)}{64a}-\frac{7c^3\text{Si}\left(7\sin^{-1}(ax)\right)}{64a}$$

```
[Out] -((c^3*(1 - a^2*x^2)^(7/2))/(a*ArcSin[a*x])) - (35*c^3*SinIntegral[ArcSin[a
*x]])/(64*a) - (63*c^3*SinIntegral[3*ArcSin[a*x]])/(64*a) - (35*c^3*SinInte
gral[5*ArcSin[a*x]])/(64*a) - (7*c^3*SinIntegral[7*ArcSin[a*x]])/(64*a)
```

Rubi [A] time = 0.17414, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4659, 4723, 4406, 3299}

$$-\frac{c^3\left(1-a^2x^2\right)^{7/2}}{a\sin^{-1}(ax)}-\frac{35c^3\text{Si}\left(\sin^{-1}(ax)\right)}{64a}-\frac{63c^3\text{Si}\left(3\sin^{-1}(ax)\right)}{64a}-\frac{35c^3\text{Si}\left(5\sin^{-1}(ax)\right)}{64a}-\frac{7c^3\text{Si}\left(7\sin^{-1}(ax)\right)}{64a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^3/ArcSin[a*x]^2,x]
```

```
[Out] -((c^3*(1 - a^2*x^2)^(7/2))/(a*ArcSin[a*x])) - (35*c^3*SinIntegral[ArcSin[a
*x]])/(64*a) - (63*c^3*SinIntegral[3*ArcSin[a*x]])/(64*a) - (35*c^3*SinInte
gral[5*ArcSin[a*x]])/(64*a) - (7*c^3*SinIntegral[7*ArcSin[a*x]])/(64*a)
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{\left(c-a^2cx^2\right)^3}{\sin^{-1}(ax)^2}\,dx = -\frac{c^3\left(1-a^2x^2\right)^{7/2}}{a\sin^{-1}(ax)} - \left(7ac^3\right)\int \frac{x\left(1-a^2x^2\right)^{5/2}}{\sin^{-1}(ax)}\,dx$$
$$= -\frac{c^3\left(1-a^2x^2\right)^{7/2}}{a\sin^{-1}(ax)} - \frac{\left(7c^3\right)\text{Subst}\left(\int \frac{\cos^6(x)\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= -\frac{c^3\left(1-a^2x^2\right)^{7/2}}{a\sin^{-1}(ax)} - \frac{\left(7c^3\right)\text{Subst}\left(\int \left(\frac{5\sin(x)}{64x}+\frac{9\sin(3x)}{64x}+\frac{5\sin(5x)}{64x}+\frac{\sin(7x)}{64x}\right)dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= -\frac{c^3\left(1-a^2x^2\right)^{7/2}}{a\sin^{-1}(ax)} - \frac{\left(7c^3\right)\text{Subst}\left(\int \frac{\sin(7x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{64a} - \frac{\left(35c^3\right)\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \sin^{-1}(\right.}{64a}$$
$$= -\frac{c^3\left(1-a^2x^2\right)^{7/2}}{a\sin^{-1}(ax)} - \frac{35c^3\text{Si}\left(\sin^{-1}(ax)\right)}{64a} - \frac{63c^3\text{Si}\left(3\sin^{-1}(ax)\right)}{64a} - \frac{35c^3\text{Si}\left(5\sin^{-1}(ax)\right)}{64a} - \frac{7c^3\text{Si}\left(7\right.}{}$$

Mathematica [A] time = 0.58046, size = 83, normalized size = 0.87

$$-\frac{c^3\left(64\left(1-a^2x^2\right)^{7/2}+35\sin^{-1}(ax)\text{Si}\left(\sin^{-1}(ax)\right)+63\sin^{-1}(ax)\text{Si}\left(3\sin^{-1}(ax)\right)+35\sin^{-1}(ax)\text{Si}\left(5\sin^{-1}(ax)\right)+7\,\text{si}\right.}{64a\sin^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^3/ArcSin[a*x]^2,x]
```

```
[Out] -(c^3*(64*(1 - a^2*x^2)^(7/2) + 35*ArcSin[a*x]*SinIntegral[ArcSin[a*x]] + 6
3*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]] + 35*ArcSin[a*x]*SinIntegral[5*Arc
Sin[a*x]] + 7*ArcSin[a*x]*SinIntegral[7*ArcSin[a*x]]))/(64*a*ArcSin[a*x])
```

Maple [A] time = 0.05, size = 105, normalized size = 1.1

$$-\frac{c^3}{64\,a\arcsin(ax)}\left(35\,\text{Si}(\arcsin(ax))\arcsin(ax)+63\,\text{Si}(3\,\arcsin(ax))\arcsin(ax)+35\,\text{Si}(5\,\arcsin(ax))\arcsin(ax\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x)
```

```
[Out] -1/64/a*c^3*(35*Si(arcsin(a*x))*arcsin(a*x)+63*Si(3*arcsin(a*x))*arcsin(a*x
)+35*Si(5*arcsin(a*x))*arcsin(a*x)+7*Si(7*arcsin(a*x))*arcsin(a*x)+cos(7*ar
csin(a*x))+21*cos(3*arcsin(a*x))+7*cos(5*arcsin(a*x))+35*(-a^2*x^2+1)^(1/2)
)/arcsin(a*x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{7\,a\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)\int \frac{\left(a^5c^3x^5-2\,a^3c^3x^3+ac^3x\right)\sqrt{ax+1}\sqrt{-ax+1}}{\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)}\,dx-\left(a^6c^3x^6-3\,a^4c^3x^4+3\,a^2c^3x^2-c^3\right)\sqrt{ax+1}}{a\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(7*(a^5*c^3*x^5 - 2
*a^3*c^3*x^3 + a*c^3*x)*sqrt(a*x + 1)*sqrt(-a*x + 1)/arctan2(a*x, sqrt(a*x
+ 1)*sqrt(-a*x + 1)), x) - (a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c
^3)*sqrt(a*x + 1)*sqrt(-a*x + 1))/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x +
 1)))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^6c^3x^6 - 3\,a^4c^3x^4 + 3\,a^2c^3x^2 - c^3}{\arcsin\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)/arcsin(a*x)^2
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-c^3\left(\int \frac{3a^2x^2}{\operatorname{asin}^2\left(ax\right)}\,dx + \int -\frac{3a^4x^4}{\operatorname{asin}^2\left(ax\right)}\,dx + \int \frac{a^6x^6}{\operatorname{asin}^2\left(ax\right)}\,dx + \int -\frac{1}{\operatorname{asin}^2\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**3/asin(a*x)**2,x)
```

```
[Out] -c**3*(Integral(3*a**2*x**2/asin(a*x)**2, x) + Integral(-3*a**4*x**4/asin(a
*x)**2, x) + Integral(a**6*x**6/asin(a*x)**2, x) + Integral(-1/asin(a*x)**2
, x))
```

Giac [A] time = 1.40312, size = 128, normalized size = 1.35

$$\frac{\left(a^2x^2 - 1\right)^3\sqrt{-a^2x^2 + 1}c^3}{a\arcsin\left(ax\right)} - \frac{7\,c^3\,\mathrm{Si}\left(7\,\arcsin\left(ax\right)\right)}{64\,a} - \frac{35\,c^3\,\mathrm{Si}\left(5\,\arcsin\left(ax\right)\right)}{64\,a} - \frac{63\,c^3\,\mathrm{Si}\left(3\,\arcsin\left(ax\right)\right)}{64\,a} - \frac{35\,c^3\,\mathrm{Si}\left(\arcsin\right.}{64\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] (a^2*x^2 - 1)^3*sqrt(-a^2*x^2 + 1)*c^3/(a*arcsin(a*x)) - 7/64*c^3*sin_integ
ral(7*arcsin(a*x))/a - 35/64*c^3*sin_integral(5*arcsin(a*x))/a - 63/64*c^3*
sin_integral(3*arcsin(a*x))/a - 35/64*c^3*sin_integral(arcsin(a*x))/a
```

3.375 $\int \frac{(c-a^2cx^2)^2}{\sin^{-1}(ax)^2}\,dx$

Optimal. Leaf size=78

$$-\frac{c^2(1-a^2x^2)^{5/2}}{a\sin^{-1}(ax)}-\frac{5c^2\mathrm{Si}\left(\sin^{-1}(ax)\right)}{8a}-\frac{15c^2\mathrm{Si}\left(3\sin^{-1}(ax)\right)}{16a}-\frac{5c^2\mathrm{Si}\left(5\sin^{-1}(ax)\right)}{16a}$$

```
[Out] -((c^2*(1 - a^2*x^2)^(5/2))/(a*ArcSin[a*x])) - (5*c^2*SinIntegral[ArcSin[a*
x]])/(8*a) - (15*c^2*SinIntegral[3*ArcSin[a*x]])/(16*a) - (5*c^2*SinIntegra
l[5*ArcSin[a*x]])/(16*a)
```

Rubi [A] time = 0.161396, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4659, 4723, 4406, 3299}

$$-\frac{c^2(1-a^2x^2)^{5/2}}{a\sin^{-1}(ax)}-\frac{5c^2\mathrm{Si}\left(\sin^{-1}(ax)\right)}{8a}-\frac{15c^2\mathrm{Si}\left(3\sin^{-1}(ax)\right)}{16a}-\frac{5c^2\mathrm{Si}\left(5\sin^{-1}(ax)\right)}{16a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^2/ArcSin[a*x]^2,x]
```

```
[Out] -((c^2*(1 - a^2*x^2)^(5/2))/(a*ArcSin[a*x])) - (5*c^2*SinIntegral[ArcSin[a*
x]])/(8*a) - (15*c^2*SinIntegral[3*ArcSin[a*x]])/(16*a) - (5*c^2*SinIntegra
l[5*ArcSin[a*x]])/(16*a)
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(c-a^2cx^2\right)^2}{\sin^{-1}(ax)^2}\,dx &= -\frac{c^2\left(1-a^2x^2\right)^{5/2}}{a\sin^{-1}(ax)} - \left(5ac^2\right)\int \frac{x\left(1-a^2x^2\right)^{3/2}}{\sin^{-1}(ax)}\,dx \\
&= -\frac{c^2\left(1-a^2x^2\right)^{5/2}}{a\sin^{-1}(ax)} - \frac{\left(5c^2\right)\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a} \\
&= -\frac{c^2\left(1-a^2x^2\right)^{5/2}}{a\sin^{-1}(ax)} - \frac{\left(5c^2\right)\text{Subst}\left(\int \left(\frac{\sin(x)}{8x}+\frac{3\sin(3x)}{16x}+\frac{\sin(5x)}{16x}\right)dx, x, \sin^{-1}(ax)\right)}{a} \\
&= -\frac{c^2\left(1-a^2x^2\right)^{5/2}}{a\sin^{-1}(ax)} - \frac{\left(5c^2\right)\text{Subst}\left(\int \frac{\sin(5x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{16a} - \frac{\left(5c^2\right)\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{8a} \\
&= -\frac{c^2\left(1-a^2x^2\right)^{5/2}}{a\sin^{-1}(ax)} - \frac{5c^2\text{Si}\left(\sin^{-1}(ax)\right)}{8a} - \frac{15c^2\text{Si}\left(3\sin^{-1}(ax)\right)}{16a} - \frac{5c^2\text{Si}\left(5\sin^{-1}(ax)\right)}{16a}
\end{aligned}$$

Mathematica [A] time = 0.487281, size = 70, normalized size = 0.9

$$-\frac{c^2\left(16\left(1-a^2x^2\right)^{5/2}+10\sin^{-1}(ax)\text{Si}\left(\sin^{-1}(ax)\right)+15\sin^{-1}(ax)\text{Si}\left(3\sin^{-1}(ax)\right)+5\sin^{-1}(ax)\text{Si}\left(5\sin^{-1}(ax)\right)\right)}{16a\sin^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^2/ArcSin[a*x]^2,x]
```

```
[Out] -(c^2*(16*(1 - a^2*x^2)^(5/2) + 10*ArcSin[a*x]*SinIntegral[ArcSin[a*x]] + 1
5*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]] + 5*ArcSin[a*x]*SinIntegral[5*ArcS
in[a*x]]))/(16*a*ArcSin[a*x])
```

Maple [A] time = 0.034, size = 83, normalized size = 1.1

$$-\frac{c^2}{16\,a\arcsin(ax)}\Big(10\,\text{Si}(\arcsin(ax))\arcsin(ax)+15\,\text{Si}(3\,\arcsin(ax))\arcsin(ax)+5\,\text{Si}(5\,\arcsin(ax))\arcsin(ax)+1$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x)
```

```
[Out] -1/16/a*c^2*(10*Si(arcsin(a*x))*arcsin(a*x)+15*Si(3*arcsin(a*x))*arcsin(a*x
)+5*Si(5*arcsin(a*x))*arcsin(a*x)+10*(-a^2*x^2+1)^(1/2)+5*cos(3*arcsin(a*x)
)+cos(5*arcsin(a*x)))/arcsin(a*x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{5\,a\arctan\left(ax, \sqrt{ax+1}\sqrt{-ax+1}\right)\int \frac{\left(a^3c^2x^3-ac^2x\right)\sqrt{ax+1}\sqrt{-ax+1}}{\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)}\,dx - \left(a^4c^2x^4-2\,a^2c^2x^2+c^2\right)\sqrt{ax+1}\sqrt{-ax+1}}{a\arctan\left(ax, \sqrt{ax+1}\sqrt{-ax+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] (a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(5*(a^3*c^2*x^3 - a*
c^2*x)*sqrt(a*x + 1)*sqrt(-a*x + 1)/arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x +
1)), x) - (a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*sqrt(a*x + 1)*sqrt(-a*x + 1))
/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{a^4c^2x^4 - 2\,a^2c^2x^2 + c^2}{\arcsin\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)/arcsin(a*x)^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$c^2\left(\int -\frac{2a^2x^2}{\operatorname{asin}^2\left(ax\right)}\,dx + \int \frac{a^4x^4}{\operatorname{asin}^2\left(ax\right)}\,dx + \int \frac{1}{\operatorname{asin}^2\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**2/asin(a*x)**2,x)
```

```
[Out] c**2*(Integral(-2*a**2*x**2/asin(a*x)**2, x) + Integral(a**4*x**4/asin(a*x)
**2, x) + Integral(asin(a*x)**(-2), x))
```

Giac [A] time = 1.43958, size = 109, normalized size = 1.4

$$-\frac{\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}c^2}{a\arcsin\left(ax\right)} - \frac{5\,c^2\,\text{Si}\left(5\,\arcsin\left(ax\right)\right)}{16\,a} - \frac{15\,c^2\,\text{Si}\left(3\,\arcsin\left(ax\right)\right)}{16\,a} - \frac{5\,c^2\,\text{Si}\left(\arcsin\left(ax\right)\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] -(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^2/(a*arcsin(a*x)) - 5/16*c^2*sin_inte
gral(5*arcsin(a*x))/a - 15/16*c^2*sin_integral(3*arcsin(a*x))/a - 5/8*c^2*s
in_integral(arcsin(a*x))/a
```

3.376 $\int \frac{c-a^2cx^2}{\sin^{-1}(ax)^2}\,dx$

Optimal. Leaf size=55

$$-\frac{c(1-a^2x^2)^{3/2}}{a\sin^{-1}(ax)}-\frac{3c\,\mathrm{Si}\left(\sin^{-1}(ax)\right)}{4a}-\frac{3c\,\mathrm{Si}\left(3\sin^{-1}(ax)\right)}{4a}$$

```
[Out] -((c*(1 - a^2*x^2)^(3/2))/(a*ArcSin[a*x])) - (3*c*SinIntegral[ArcSin[a*x]])
/(4*a) - (3*c*SinIntegral[3*ArcSin[a*x]])/(4*a)
```

Rubi [A] time = 0.117651, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4659, 4723, 4406, 3299}

$$-\frac{c(1-a^2x^2)^{3/2}}{a\sin^{-1}(ax)}-\frac{3c\,\mathrm{Si}\left(\sin^{-1}(ax)\right)}{4a}-\frac{3c\,\mathrm{Si}\left(3\sin^{-1}(ax)\right)}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)/ArcSin[a*x]^2,x]
```


```
[Out] -((c*(1 - a^2*x^2)^(3/2))/(a*ArcSin[a*x])) - (3*c*SinIntegral[ArcSin[a*x]])
/(4*a) - (3*c*SinIntegral[3*ArcSin[a*x]])/(4*a)
```


Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{c-a^2cx^2}{\sin^{-1}(ax)^2}\,dx &= -\frac{c\left(1-a^2x^2\right)^{3/2}}{a\sin^{-1}(ax)}-(3ac)\int \frac{x\sqrt{1-a^2x^2}}{\sin^{-1}(ax)}\,dx\\ &= -\frac{c\left(1-a^2x^2\right)^{3/2}}{a\sin^{-1}(ax)}-\frac{(3c)\,\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{a}\\ &= -\frac{c\left(1-a^2x^2\right)^{3/2}}{a\sin^{-1}(ax)}-\frac{(3c)\,\text{Subst}\left(\int \left(\frac{\sin(x)}{4x}+\frac{\sin(3x)}{4x}\right)dx,x,\sin^{-1}(ax)\right)}{a}\\ &= -\frac{c\left(1-a^2x^2\right)^{3/2}}{a\sin^{-1}(ax)}-\frac{(3c)\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{4a}-\frac{(3c)\,\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{4a}\\ &= -\frac{c\left(1-a^2x^2\right)^{3/2}}{a\sin^{-1}(ax)}-\frac{3c\,\text{Si}\left(\sin^{-1}(ax)\right)}{4a}-\frac{3c\,\text{Si}\left(3\sin^{-1}(ax)\right)}{4a}\end{aligned}$$

Mathematica [A] time = 0.222179, size = 55, normalized size = 1.

$$-\frac{c\left(4\left(1-a^2x^2\right)^{3/2}+3\sin^{-1}(ax)\text{Si}\left(\sin^{-1}(ax)\right)+3\sin^{-1}(ax)\text{Si}\left(3\sin^{-1}(ax)\right)\right)}{4a\sin^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)/ArcSin[a*x]^2,x]
```

```
[Out] -(c*(4*(1 - a^2*x^2)^(3/2) + 3*ArcSin[a*x]*SinIntegral[ArcSin[a*x]] + 3*Arc
Sin[a*x]*SinIntegral[3*ArcSin[a*x]]))/(4*a*ArcSin[a*x])
```

Maple [A] time = 0.032, size = 59, normalized size = 1.1

$$-\frac{c}{4\,a\arcsin(ax)}\left(3\,\text{Si}\left(\arcsin(ax)\right)\arcsin(ax)+3\,\text{Si}\left(3\,\arcsin(ax)\right)\arcsin(ax)+3\,\sqrt{-a^2x^2+1}+\cos\left(3\,\arcsin(ax)\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)/arcsin(a*x)^2,x)
```

```
[Out] -1/4/a*c*(3*Si(arcsin(a*x))*arcsin(a*x)+3*Si(3*arcsin(a*x))*arcsin(a*x)+3*(
-a^2*x^2+1)^(1/2)+cos(3*arcsin(a*x)))/arcsin(a*x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3\,a^2c\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)\int \frac{\sqrt{ax+1}\sqrt{-ax+1}x}{\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)}\,dx-\left(a^2cx^2-c\right)\sqrt{ax+1}\sqrt{-ax+1}}{a\arctan\left(ax,\sqrt{ax+1}\sqrt{-ax+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(3*a^2*c*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(sqrt(a*x + 1
)*sqrt(-a*x + 1)*x/arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)), x) - (a^2*c*
```

```
x^2 - c)*sqrt(a*x + 1)*sqrt(-a*x + 1))/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-
a*x + 1)))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{a^2cx^2 - c}{\arcsin(ax)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c*x^2 - c)/arcsin(a*x)^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-c\left(\int \frac{a^2x^2}{\operatorname{asin}^2(ax)}\,dx + \int -\frac{1}{\operatorname{asin}^2(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)/asin(a*x)**2,x)
```

```
[Out] -c*(Integral(a**2*x**2/asin(a*x)**2, x) + Integral(-1/asin(a*x)**2, x))
```

Giac [A] time = 1.38418, size = 66, normalized size = 1.2

$$-\frac{3\,c\,\mathrm{Si}(3\,\arcsin(ax))}{4\,a} - \frac{3\,c\,\mathrm{Si}(\arcsin(ax))}{4\,a} - \frac{\left(-a^2x^2+1\right)^{\frac{3}{2}}c}{a\arcsin(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] -3/4*c*sin_integral(3*arcsin(a*x))/a - 3/4*c*sin_integral(arcsin(a*x))/a -
(-a^2*x^2 + 1)^(3/2)*c/(a*arcsin(a*x))
```

3.377 $\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)^2}\,dx$

Optimal. Leaf size=58

$$\frac{a\text{Unintegrable}\left(\frac{x}{(1-a^2x^2)^{3/2}\sin^{-1}(ax)},x\right)}{c}-\frac{1}{ac\sqrt{1-a^2x^2}\sin^{-1}(ax)}$$

```
[Out] -(1/(a*c*Sqrt[1 - a^2*x^2]*ArcSin[a*x])) + (a*Unintegrable[x/((1 - a^2*x^2)
^(3/2)*ArcSin[a*x]), x])/c
```

Rubi [A] time = 0.0956909, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)*ArcSin[a*x]^2),x]
```

```
[Out] -(1/(a*c*Sqrt[1 - a^2*x^2]*ArcSin[a*x])) + (a*Defer[Int][x/((1 - a^2*x^2)^(
3/2)*ArcSin[a*x]), x])/c
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)^2}\,dx=-\frac{1}{ac\sqrt{1-a^2x^2}\sin^{-1}(ax)}+\frac{a\int \frac{x}{(1-a^2x^2)^{3/2}\sin^{-1}(ax)}\,dx}{c}$$

Mathematica [A] time = 3.76265, size = 0, normalized size = 0.

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]^2),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]^2), x]
```

Maple [A] time = 0.102, size = 0, normalized size = 0.

$$\int \frac{1}{(-a^2cx^2+c)(\arcsin(ax))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x)
```

```
[Out] int(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{1}{\left(a^2cx^2-c\right)\arcsin\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(-1/((a^2*c*x^2 - c)*arcsin(a*x)^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{1}{a^2x^2\operatorname{asin}^2\left(ax\right)-\operatorname{asin}^2\left(ax\right)}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)/asin(a*x)**2,x)
```

```
[Out] -Integral(1/(a**2*x**2*asin(a*x)**2 - asin(a*x)**2), x)/c
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{1}{\left(a^2cx^2-c\right)\arcsin\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(-1/((a^2*c*x^2 - c)*arcsin(a*x)^2), x)
```

3.378 $\int \frac{1}{\left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^2} \, dx$

Optimal. Leaf size=59

$$\frac{3a\text{Unintegrable}\left(\frac{x}{\left(1-a^2x^2\right)^{5/2}\sin^{-1}(ax)},x\right)}{c^2}-\frac{1}{ac^2\left(1-a^2x^2\right)^{3/2}\sin^{-1}(ax)}$$

```
[Out] -(1/(a*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[a*x])) + (3*a*Unintegrable[x/((1 - a^
2*x^2)^(5/2)*ArcSin[a*x]), x])/c^2
```

Rubi [A] time = 0.0974797, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[a*x])) + (3*a*Defer[Int][x/((1 - a^2*
x^2)^(5/2)*ArcSin[a*x]), x])/c^2
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^2} \, dx=-\frac{1}{ac^2\left(1-a^2x^2\right)^{3/2}\sin^{-1}(ax)}+\frac{(3a)\int \frac{x}{\left(1-a^2x^2\right)^{5/2}\sin^{-1}(ax)} \, dx}{c^2}$$

Mathematica [A] time = 14.5328, size = 0, normalized size = 0.

$$\int \frac{1}{\left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2), x]
```

Maple [A] time = 0.289, size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^2cx^2+c\right)^2 \left(\arcsin(ax)\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(a^4c^2x^4 - 2\,a^2c^2x^2 + c^2\right)\arcsin\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*arcsin(a*x)^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\frac{\int \frac{1}{a^4x^4\operatorname{asin}^2(ax) - 2a^2x^2\operatorname{asin}^2(ax) + \operatorname{asin}^2(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**2/asin(a*x)**2,x)
```

```
[Out] Integral(1/(a**4*x**4*asin(a*x)**2 - 2*a**2*x**2*asin(a*x)**2 + asin(a*x)**
2), x)/c**2
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a^2cx^2 - c\right)^2 \arcsin\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)^2), x)
```

3.379 $\int \left(\frac{1}{(1-x^2)\sin^{-1}(x)^2}-\frac{x}{(1-x^2)^{3/2}\sin^{-1}(x)}\right)dx$

Optimal. Leaf size=17

$$-\frac{1}{\sqrt{1-x^2}\sin^{-1}(x)}$$

```
[Out] -(1/(Sqrt[1 - x^2]*ArcSin[x]))
```

Rubi [A] time = 0.12504, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.03, Rules used = {4659}

$$-\frac{1}{\sqrt{1-x^2}\sin^{-1}(x)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((1 - x^2)*ArcSin[x]^2) - x/((1 - x^2)^(3/2)*ArcSin[x]),x]
```

```
[Out] -(1/(Sqrt[1 - x^2]*ArcSin[x]))
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{1}{(1-x^2)\sin^{-1}(x)^2}-\frac{x}{(1-x^2)^{3/2}\sin^{-1}(x)}\right)dx &= \int \frac{1}{(1-x^2)\sin^{-1}(x)^2}\,dx-\int \frac{x}{(1-x^2)^{3/2}\sin^{-1}(x)}\,dx\\ &= -\frac{1}{\sqrt{1-x^2}\sin^{-1}(x)}\end{aligned}$$

Mathematica [A] time = 0.150456, size = 17, normalized size = 1.

$$-\frac{1}{\sqrt{1-x^2}\sin^{-1}(x)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((1 - x^2)*ArcSin[x]^2) - x/((1 - x^2)^(3/2)*ArcSin[x]),x]
```

```
[Out] -(1/(Sqrt[1 - x^2]*ArcSin[x]))
```

Maple [F] time = 1.068, size = 0, normalized size = 0.

$$\int \frac{1}{\left(\arcsin\left(x\right)\right)^{2}\left(-x^{2}+1\right)}-\frac{x}{\arcsin\left(x\right)}\left(-x^{2}+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x)
```

```
[Out] int(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x)
```

Maxima [B] time = 3.10865, size = 50, normalized size = 2.94

$$\frac{\sqrt{x+1}\sqrt{-x+1}}{\left(x^{2}-1\right)\arctan\left(x,\sqrt{x+1}\sqrt{-x+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="m
axima")
```

```
[Out] sqrt(x + 1)*sqrt(-x + 1)/((x^2 - 1)*arctan2(x, sqrt(x + 1)*sqrt(-x + 1)))
```

Fricas [A] time = 1.67678, size = 51, normalized size = 3.

$$\frac{\sqrt{-x^{2}+1}}{\left(x^{2}-1\right)\arcsin\left(x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="f
ricas")
```

```
[Out] sqrt(-x^2 + 1)/((x^2 - 1)*arcsin(x))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(x-1\right)\left(x+1\right)\left(x\operatorname{asin}\left(x\right)-\sqrt{1-x^{2}}\right)}{\left(-\left(x-1\right)\left(x+1\right)\right)^{\frac{5}{2}}\operatorname{asin}^{2}\left(x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x**2+1)/asin(x)**2-x/(-x**2+1)**(3/2)/asin(x),x)
```

```
[Out] Integral((x - 1)*(x + 1)*(x*asin(x) - sqrt(1 - x**2))/((-(x - 1)*(x + 1))**
(5/2)*asin(x)**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{x}{\left(-x^2+1\right)^{\frac{3}{2}}\arcsin\left(x\right)} - \frac{1}{\left(x^2-1\right)\arcsin\left(x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="g
iac")
```

```
[Out] integrate(-x/((-x^2 + 1)^(3/2)*arcsin(x)) - 1/((x^2 - 1)*arcsin(x)^2), x)
```

3.380 $\int \frac{x^m\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\sqrt{1-c^2x^2}x^m}{\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2, x]
```

Rubi [A] time = 0.113687, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{x^m\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^m\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 0.502592, size = 0, normalized size = 0.

$$\int \frac{x^m\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 0.668, size = 0, normalized size = 0.

$$\int \frac{x^m}{(a+b\arcsin(cx))^2}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^m}{b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^m\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{\left(a+b\,\text{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**m*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-c^2x^2+1}x^m}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a)^2, x)
```

3.381 $\int \frac{x^3\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=214

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16b^2c^4}-\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16b^2c^4}$$

```
[Out] -((x^3*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(8*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*A
rcSin[c*x]))/b])/(16*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b])/(16*b^2*c^4) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(
8*b^2*c^4) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^
2*c^4) - (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^
4)
```

Rubi [A] time = 0.633116, antiderivative size = 210, normalized size of antiderivative = 0.98, number of steps used = 22, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4721, 4635, 4406, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16b^2c^4}-\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+5\sin\right.}{16b^2c^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[a/
b + ArcSin[c*x]])/(8*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3*Arc
Sin[c*x]])/(16*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*a)/b + 5*ArcSin[c*
x]])/(16*b^2*c^4) + (Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(8*b^2*c^4) +
 (3*Sin[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b^2*c^4) - (5*Si
n[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b^2*c^4)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^3\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(5c)\int \frac{x^4}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^3\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{5\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin^4(x)}{a+bx}\right.}{bc^4}$$

$$= -\frac{x^3\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\,\mathrm{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)} - \frac{\cos(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{5\,\mathrm{Subst}\left(\int \left(\frac{\cos}{8(a+}\right.\right.}{}$$

$$= -\frac{x^3\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{5\,\mathrm{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc^4} - \frac{5\,\mathrm{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \sin^{-1}\right.}{8bc^4}$$

$$= -\frac{x^3\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8bc^4} + \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\mathrm{Subs}}{}$$

$$= -\frac{x^3\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16b^2c^4} - \frac{5}{}$$

Mathematica [A] time = 0.543693, size = 175, normalized size = 0.82

$$\frac{16bc^5x^5}{a+b\sin^{-1}(cx)} - \frac{16bc^3x^3}{a+b\sin^{-1}(cx)} + 2\cos\left(\frac{a}{b}\right)\mathrm{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) + 3\cos\left(\frac{3a}{b}\right)\mathrm{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) - 5\,\mathrm{c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-16*b*c^3*x^3)/(a + b*ArcSin[c*x]) + (16*b*c^5*x^5)/(a + b*ArcSin[c*x]) +
 2*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*CosIntegral[3*(
a/b + ArcSin[c*x])] - 5*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 2
*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Sin[(3*a)/b]*SinIntegral[3*(a/
b + ArcSin[c*x])] - 5*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*
b^2*c^4)
```

Maple [A] time = 0.056, size = 340, normalized size = 1.6

$$-\frac{1}{16\,c^{4}\left(a+b\arcsin\left(cx\right)\right)b^{2}}\left(5\arcsin\left(cx\right)\sin\left(5\,\frac{a}{b}\right)\mathrm{Si}\left(5\arcsin\left(cx\right)+5\,\frac{a}{b}\right)b+5\arcsin\left(cx\right)\mathrm{Ci}\left(5\arcsin\left(cx\right)+5\,\frac{a}{b}\right)\mathrm{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/16/c^4*(5*arcsin(c*x)*sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*b+5*arcsin(c*x)
*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-2*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin
(a/b)*b-2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b-3*arcsin(c*x)*Si(3*arc
sin(c*x)+3*a/b)*sin(3*a/b)*b-3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/
b)*b+5*sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5
*a/b)*a-2*Si(arcsin(c*x)+a/b)*sin(a/b)*a-2*Ci(arcsin(c*x)+a/b)*cos(a/b)*a-3
*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*
a+2*x*b*c-sin(5*arcsin(c*x))*b+sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^{2}x^{5}-x^{3}-\frac{\left(b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\left(5\,c^{2}\int\frac{x^{4}}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx-3\int\frac{x^{2}}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx\right)}{bc}}{b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^5 - x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
*integrate((5*c^2*x^4 - 3*x^2)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b
*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^{2}x^{2}+1}x^{3}}{b^{2}\arcsin\left(cx\right)^{2}+2\,ab\arcsin\left(cx\right)+a^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3\sqrt{-(cx-1)(cx+1)}}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.70335, size = 1686, normalized size = 7.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -5*b*arcsin(c*x)*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 5*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(5
*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5*a*cos(a/b)^5*co
s_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5*a*c
os(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 25/4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/4*b*arcsin(c*x)*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 15/4*b
*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) + 3/4*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_int
egral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 -
 1)^2*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 25/4*a*cos(a/b)^3*cos_integ
ral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/4*a*cos(a/
b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
+ 15/4*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*a
rcsin(c*x) + a*b^2*c^4) + 3/4*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*
arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 - 1)*b*c*x/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) - 25/16*b*arcsin(c*x)*cos(a/b)*cos_integral(5*a
/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/16*b*arcsin(c*x)*
cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c
^4) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*a
rcsin(c*x) + a*b^2*c^4) - 5/16*b*arcsin(c*x)*sin(a/b)*sin_integral(5*a/b +
5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 3/16*b*arcsin(c*x)*sin(a
/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) +
 1/8*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin
(c*x) + a*b^2*c^4) - 25/16*a*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))/(
b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/16*a*cos(a/b)*cos_integral(3*a/b + 3*a
rcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 1/8*a*cos(a/b)*cos_integral
(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5/16*a*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 3/16*a
*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*
c^4) + 1/8*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x)
+ a*b^2*c^4)
```

3.382 $\int \frac{x^2\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=94

$$-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2b^2c^3}-\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -((x^2*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(4*(a + b*A
rcSin[c*x]))/b]*Sin[(4*a)/b])/(2*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a
 + b*ArcSin[c*x]))/b])/(2*b^2*c^3)
```

Rubi [A] time = 0.468122, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 7, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4721, 4635, 4406, 12, 3303, 3299, 3302}

$$-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{2b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{2b^2c^3}-\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(4*a)/b + 4
*ArcSin[c*x]]*Sin[(4*a)/b])/(2*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*a)/b
 + 4*ArcSin[c*x]])/(2*b^2*c^3)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^2\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\int \frac{x}{a+b\sin^{-1}(cx)}\,dx}{bc}-\frac{(4c)\int \frac{x^3}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\,\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{4\,\text{Subst}\left(\int \frac{\cos(x)\sin^3(x)}{a+bx}\,d\right.}{bc^3}$$

$$= -\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\,\text{Subst}\left(\int \frac{\sin(2x)}{2(a+bx)}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{4\,\text{Subst}\left(\int\left(\frac{\sin(2x)}{4(a+bx)}-\frac{\sin(4x)}{8(a+bx)}\right.\right.}{bc^3}$$

$$= -\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2bc^3}$$

$$= -\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}+4x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int\right.}{}$$

$$= -\frac{x^2\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{2b^2c^3}$$

Mathematica [A] time = 0.322192, size = 82, normalized size = 0.87

$$\frac{\frac{2bc^2x^2\left(c^2x^2-1\right)}{a+b\sin^{-1}(cx)}-\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)}{2b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((2*b*c^2*x^2*(-1 + c^2*x^2))/(a + b*ArcSin[c*x]) - CosIntegral[4*(a/b + Ar
cSin[c*x])]*Sin[(4*a)/b] + Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])])
```

```
/(2*b^2*c^3)
```

Maple [A] time = 0.046, size = 136, normalized size = 1.5

$$\frac{1}{8\,c^{3}\left(a+b\arcsin\left(cx\right)\right)b^{2}}\left(4\arcsin\left(cx\right)\mathrm{Si}\left(4\arcsin\left(cx\right)+4\,\frac{a}{b}\right)\cos\left(4\,\frac{a}{b}\right)b-4\arcsin\left(cx\right)\mathrm{Ci}\left(4\arcsin\left(cx\right)+4\,\frac{a}{b}\right)\sin\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/8/c^3*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*C
i(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+4*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-
4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+cos(4*arcsin(c*x))*b-b)/(a+b*arcsin(
c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^{2}x^{4}-x^{2}-2\left(b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int\frac{2\,c^{2}x^{3}-x}{b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}\,dx}{b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^4 - x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
*integrate(2*(2*c^2*x^3 - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c
)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^{2}x^{2}+1}x^{2}}{b^{2}\arcsin\left(cx\right)^{2}+2\,ab\arcsin\left(cx\right)+a^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{2}\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{\left(a+b\,\mathrm{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.52963, size = 760, normalized size = 8.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4
*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 4*a*cos(a/b)^3*co
s_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + 4*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x)
 + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x)
)*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 4*b*arcsin(c*x)*cos(a/b)^2*s
in_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*a*
cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x)
+ a*b^2*c^3) - 4*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*
arcsin(c*x) + a*b^2*c^3) + (c^2*x^2 - 1)^2*b/(b^3*c^3*arcsin(c*x) + a*b^2*c
^3) + 1/2*b*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin
(c*x) + a*b^2*c^3) + (c^2*x^2 - 1)*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/
2*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

3.383 $\int \frac{x\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=150

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b^2c^2}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{4b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b^2c^2}+\frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\right.}{4b}$$

```
[Out] -((x*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a +
 b*ArcSin[c*x])/b])/(4*b^2*c^2) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(4*b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/
(4*b^2*c^2) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^
2*c^2)
```

Rubi [A] time = 0.370196, antiderivative size = 198, normalized size of antiderivative = 1.32, number of steps used = 14, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {4721, 4623, 3303, 3299, 3302, 4635, 4406}

$$-\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^2}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4b^2c^2}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(c}{b}\right.}{b^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) - (3*Cos[a/b]*CosIntegral[a/
b + ArcSin[c*x]])/(4*b^2*c^2) + (3*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3*Arc
Sin[c*x]])/(4*b^2*c^2) + (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b^2
*c^2) - (3*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b^2*c^2) + (3*Sin[(3
*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(4*b^2*c^2) + (Sin[a/b]*SinInt
egral[(a + b*ArcSin[c*x])/b])/(b^2*c^2)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{x\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\int \frac{1}{a+b\sin^{-1}(cx)}\,dx}{bc}-\frac{(3c)\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{b^2c^2}-\frac{3\,\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\right.}{bc^2}$$

$$= -\frac{x\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{3\,\text{Subst}\left(\int\left(\frac{\cos(x)}{4(a+bx)}-\frac{\cos(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\right.}{}$$

$$= -\frac{x\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}-\frac{3\,\text{Subst}\left(\int \right.}{}$$

$$= -\frac{x\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}-\frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{S}}{}$$

$$= -\frac{x\left(1-c^2x^2\right)}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{3\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^2}+\frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4b^2c^2}+$$

Mathematica [A] time = 0.282707, size = 125, normalized size = 0.83

$$\frac{\frac{4bc^3x^3}{a+b\sin^{-1}(cx)}+\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin\right.}{4b^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-4*b*c*x)/(a + b*ArcSin[c*x]) + (4*b*c^3*x^3)/(a + b*ArcSin[c*x]) + Cos[a
/b]*CosIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + Ar
cSin[c*x])] + Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Sin[(3*a)/b]*SinI
ntegral[3*(a/b + ArcSin[c*x])])/(4*b^2*c^2)
```

Maple [A] time = 0.049, size = 223, normalized size = 1.5

$$\frac{1}{4\,c^2\,(a+b\arcsin(cx))\,b^2}\left(3\,\arcsin(cx)\,\mathrm{Si}\left(3\,\arcsin(cx)+3\,\frac{a}{b}\right)\sin\left(3\,\frac{a}{b}\right)b+3\,\arcsin(cx)\,\mathrm{Ci}\left(3\,\arcsin(cx)+3\,\frac{a}{b}\right)\cos\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/4/c^2*(3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+3*arcsin(c*x)*C
i(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b
)*b+arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+3*Si(3*arcsin(c*x)+3*a/b)*si
n(3*a/b)*a+3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+Si(arcsin(c*x)+a/b)*sin(a
/b)*a+Ci(arcsin(c*x)+a/b)*cos(a/b)*a-x*b*c-sin(3*arcsin(c*x))*b)/(a+b*arcsi
n(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^2x^3 - x - \frac{\left(b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\left(3\,c^2\int\frac{x^2}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx-\int\frac{1}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx\right)}{bc}}{b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integ
rate((3*c^2*x^2 - 1)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c), x) - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}x}{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{\left(a+b\,\mathrm{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.51697, size = 821, normalized size = 5.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 3*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 3*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(3*
a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 3*a*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 3*a*co
s(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) + (c^2*x^2 - 1)*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 9/4*
b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 1/4*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*
x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 3/4*b*arcsin(c*x)*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/4*b*arcsi
n(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^
2*c^2) - 9/4*a*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) + 1/4*a*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^
2*arcsin(c*x) + a*b^2*c^2) - 3/4*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c
*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/4*a*sin(a/b)*sin_integral(a/b +
arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

3.384 $\int \frac{\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=86

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c}-\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -((1 - c^2*x^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b*ArcSin[
c*x]))/b]*Sin[(2*a)/b])/(b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSi
n[c*x]))/b])/(b^2*c)
```

Rubi [A] time = 0.162483, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {4659, 4635, 4406, 12, 3303, 3299, 3302}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c}-\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*a)/b + 2*ArcSi
n[c*x]]*Sin[(2*a)/b])/(b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSi
n[c*x]])/(b^2*c)
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{(2c)\int \frac{x}{a+b\sin^{-1}(cx)}\,dx}{b}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{2\,\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{2\,\text{Subst}\left(\int \frac{\sin(2x)}{2(a+bx)}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int\right.}{}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c}
\end{aligned}$$

Mathematica [A] time = 0.198103, size = 72, normalized size = 0.84

$$\frac{\frac{b\left(c^2x^2-1\right)}{a+b\sin^{-1}(cx)}+\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)}{b^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((b*(-1 + c^2*x^2))/(a + b*ArcSin[c*x]) + CosIntegral[2*(a/b + ArcSin[c*x])
]*Sin[(2*a)/b] - Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b^2*c)
```

Maple [A] time = 0.046, size = 134, normalized size = 1.6

$$-\frac{1}{2b^2c(a+b\arcsin(cx))}\left(2\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx)+2\frac{a}{b}\right)\cos\left(2\frac{a}{b}\right)b-2\arcsin(cx)\,\mathrm{Ci}\left(2\arcsin(cx)+2\frac{a}{b}\right)\sin\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/2/c*(2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-2*arcsin(c*x)*Ci
(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-2
*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(2*arcsin(c*x))*b+b)/b^2/(a+b*arcs
in(c*x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^2x^2-\frac{2\left(b^2c^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc^2\right)\int\frac{x}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx}{b}-1}{b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 - 2*(b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)
*integrate(x/(b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b), x) - 1
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}}{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2),
x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-(cx-1)(cx+1)}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.55515, size = 392, normalized size = 4.56

$$\frac{2\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{2\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{2\,a\cos\left(\frac{a}{b}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*
c*arcsin(c*x) + a*b^2*c) - 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b +
2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 2*a*cos(a/b)*cos_integral(2*
a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*a*cos(a/b)^
2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + b*arc
sin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
+ (c^2*x^2 - 1)*b/(b^3*c*arcsin(c*x) + a*b^2*c) + a*sin_integral(2*a/b + 2*
arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
```

3.385 $\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=104

$$-\frac{\text{Unintegrable}\left(\frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)},x\right)}{bc}-\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2}-\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2}-\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -((1 - c^2*x^2)/(b*c*x*(a + b*ArcSin[c*x]))) - (Cos[a/b]*CosIntegral[(a + b
*ArcSin[c*x])/b])/b^2 - (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/b^2 -
 Unintegrable[1/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi [A] time = 0.203671, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*x*(a + b*ArcSin[c*x]))) - (Cos[a/b]*CosIntegral[(a + b
*ArcSin[c*x])/b])/b^2 - (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/b^2 -
 Defer[Int][1/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}-\frac{c\int \frac{1}{a+b\sin^{-1}(cx)}\,dx}{b}\\
&= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{b^2}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}\\
&= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}-\frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{b^2}\\
&= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2}-\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}
\end{aligned}$$

Mathematica [A] time = 10.226, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.532, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin\left(cx\right)\right)^{2}}\sqrt{-c^{2}x^{2}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x)

[Out] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{c^{2}x^{2}-\frac{\left(b^{2}cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx\right)\left(c^{2}\int\frac{x^{2}}{bx^{2}\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ax^{2}}\,dx+\int\frac{1}{\left(b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a\right)x^{2}}\,dx\right)}{bc}-1}{b^{2}cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] (c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)*i
ntegrate((c^2*x^2 + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
) + a*b*c*x^2), x) - 1)/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
 + a*b*c*x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^{2}x^{2}+1}}{b^{2}x\arcsin\left(cx\right)^{2}+2\,abx\arcsin\left(cx\right)+a^{2}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^
2*x), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x\left(a+b\,\mathrm{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x), x)
```

3.386 $\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=56

$$-\frac{2\text{Unintegrable}\left(\frac{1}{x^3\left(a+b\sin^{-1}(cx)\right)},x\right)}{bc}-\frac{1-c^2x^2}{bcx^2\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -((1 - c^2*x^2)/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Unintegrable[1/(x^3*(a
+ b*ArcSin[c*x])), x])/(b*c)
```

Rubi [A] time = 0.149065, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][1/(x^3*(a +
b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1-c^2x^2}{bcx^2\left(a+b\sin^{-1}(cx)\right)}-\frac{2\int \frac{1}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A] time = 2.32268, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.43, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)^2}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{c^2x^2 - \frac{2\left(b^2cx^2 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^2\right)\int \frac{1}{\left(b \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+a\right)x^3}\,dx}{bc} - 1}{b^2cx^2 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 - 2*(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*
x^2)*integrate(1/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c*x^3), x) - 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a
*b*c*x^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}}{b^2x^2 \arcsin\left(cx\right)^2 + 2\,abx^2 \arcsin\left(cx\right) + a^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x)
+ a^2*x^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x^2\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**2*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{\left(b \arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x^2), x)
```

3.387 $\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.121498, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 15.6112, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 3.499, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+b\arcsin(cx)\right)^2}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{c^2x^2 + \frac{\left(b^2cx^3\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^3\right)\left(c^2\int\frac{x^2}{bx^4\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ax^4}\,dx-3\int\frac{1}{bx^4\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ax^4}\,dx\right)}{bc} - 1}{b^2cx^3\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 + (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^
3)*integrate((c^2*x^2 - 3)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)) + a*b*c*x^4), x) - 1)/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + a*b*c*x^3)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{-c^2x^2+1}}{b^2x^3\arcsin\left(cx\right)^2 + 2\,abx^3\arcsin\left(cx\right) + a^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x)
+ a^2*x^3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x^3\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**3*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-c^2x^2+1}}{\left(b\arcsin\left(cx\right)+a\right)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x^3), x)
```

3.388 $\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.120872, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 3.44463, size = 0, normalized size = 0.

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 5.385, size = 0, normalized size = 0.

$$\int \frac{1}{x^4\left(a+b\arcsin(cx)\right)^2}\sqrt{-c^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{c^2x^2 + 2\left(b^2cx^4\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^4\right)\int \frac{c^2x^2-2}{b^2cx^5\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^5}\,dx - 1}{b^2cx^4\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 + (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^
4)*integrate(2*(c^2*x^2 - 2)/(b^2*c*x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)) + a*b*c*x^5), x) - 1)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b*c*x^4)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}}{b^2x^4\arcsin(cx)^2 + 2\,abx^4\arcsin(cx) + a^2x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x)
+ a^2*x^4), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-(cx-1)(cx+1)}}{x^4(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**4/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**4*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x^4), x)
```

3.389 $\int \frac{x^m\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\left(1-c^2x^2\right)^{3/2}x^m}{\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi [A] time = 0.134823, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{x^m\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^m\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 0.536446, size = 0, normalized size = 0.

$$\int \frac{x^m\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 0.869, size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(a+b\arcsin\left(cx\right)\right)^2}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(c^2x^2-1)\sqrt{-c^2x^2+1}x^m}{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^2 + 2*a*b*a
rcsin(c*x) + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{(-c^2x^2+1)^{\frac{3}{2}}x^m}{(b\arcsin(cx)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^m/(b*arcsin(c*x) + a)^2, x)
```

3.390 $\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=278

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{64b^2c^4}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{64b^2c^4}-\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\sin^{-1}(cx))}{b}\right)}{64b^2c^4}$$

```
[Out] -((x^3*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[(a + b*ArcSin[c*x])/b])/(64*b^2*c^4) + (9*Cos[(3*a)/b]*CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b])/(64*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*
ArcSin[c*x]))/b])/(64*b^2*c^4) - (7*Cos[(7*a)/b]*CosIntegral[(7*(a + b*ArcS
in[c*x]))/b])/(64*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b]
)/(64*b^2*c^4) + (9*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(6
4*b^2*c^4) - (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(64*b^
2*c^4) - (7*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b^2*c^
4)
```

Rubi [A] time = 0.889903, antiderivative size = 274, normalized size of antiderivative = 0.99, number of steps used = 28, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4721, 4723, 4406, 3303, 3299, 3302}

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64b^2c^4}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{64b^2c^4}-\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+5\text{s}\right.}{64b^2c^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[a/b + ArcSin[c*x]])/(64*b^2*c^4) + (9*Cos[(3*a)/b]*CosIntegral[(3*a)/b +
3*ArcSin[c*x]])/(64*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*a)/b + 5*ArcS
in[c*x]])/(64*b^2*c^4) - (7*Cos[(7*a)/b]*CosIntegral[(7*a)/b + 7*ArcSin[c*x
]])/(64*b^2*c^4) + (3*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(64*b^2*c^4)
 + (9*Sin[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(64*b^2*c^4) - (5*
Sin[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(64*b^2*c^4) - (7*Sin[(7
*a)/b]*SinIntegral[(7*a)/b + 7*ArcSin[c*x]])/(64*b^2*c^4)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
```

```
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^3\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\int \frac{x^2\left(1-c^2x^2\right)}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(7c)\int \frac{x^4\left(1-c^2x^2\right)}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\,\text{Subst}\left(\int \frac{\cos^3(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{7\,\text{Subst}\left(\int \frac{\cos^3(x)\sin^4(x}{a+bx}\right.}{bc^4}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\,\text{Subst}\left(\int \left(\frac{\cos(x)}{8(a+bx)} - \frac{\cos(3x)}{16(a+bx)} - \frac{\cos(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^4} - 7\,\text{Sub}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{7\,\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64bc^4} - \frac{7\,\text{Subst}\left(\int \frac{\cos(7x)}{a+bx}\,dx, x, \sin^{-}\right.}{64bc^4}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(21\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64bc^4} + \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Sub}}{}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64b^2c^4} + \frac{9\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{64b^2c^4} -$$

Mathematica [A] time = 1.05366, size = 399, normalized size = 1.44

$$-\frac{-3\cos\left(\frac{a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) - 9\cos\left(\frac{3a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(c\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(64*b*c^3*x^3 - 128*b*c^5*x^5 + 64*b*c^7*x^7 - 3*(a + b*ArcSin[c*x])*Cos[a
/b]*CosIntegral[a/b + ArcSin[c*x]] - 9*(a + b*ArcSin[c*x])*Cos[(3*a)/b]*Cos
Integral[3*(a/b + ArcSin[c*x])] + 5*a*Cos[(5*a)/b]*CosIntegral[5*(a/b + Arc
Sin[c*x])] + 5*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])
] + 7*a*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 7*b*ArcSin[c*x]*C
os[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] - 3*a*Sin[a/b]*SinIntegral[a
/b + ArcSin[c*x]] - 3*b*ArcSin[c*x]*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]]
 - 9*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 9*b*ArcSin[c*x]*Si
n[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*a*Sin[(5*a)/b]*SinIntegra
l[5*(a/b + ArcSin[c*x])] + 5*b*ArcSin[c*x]*Sin[(5*a)/b]*SinIntegral[5*(a/b
+ ArcSin[c*x])] + 7*a*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] + 7*b
*ArcSin[c*x]*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])])/(64*b^2*c^4*(
a + b*ArcSin[c*x]))
```

Maple [A] time = 0.061, size = 455, normalized size = 1.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/64/c^4*(5*arcsin(c*x)*sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*b+5*arcsin(c*x)
*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-3*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin
(a/b)*b-3*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+7*arcsin(c*x)*Si(7*arc
sin(c*x)+7*a/b)*sin(7*a/b)*b+7*arcsin(c*x)*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/
b)*b-9*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b-9*arcsin(c*x)*Ci(3*
arcsin(c*x)+3*a/b)*cos(3*a/b)*b+5*sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*a+5*Ci
(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a-3*Si(arcsin(c*x)+a/b)*sin(a/b)*a-3*Ci(ar
csin(c*x)+a/b)*cos(a/b)*a+7*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*a+7*Ci(7*arc
sin(c*x)+7*a/b)*cos(7*a/b)*a-9*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-9*Ci(3*
arcsin(c*x)+3*a/b)*cos(3*a/b)*a+3*x*b*c-sin(5*arcsin(c*x))*b-sin(7*arcsin(c
*x))*b+3*sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{c^4x^7 - 2\,c^2x^5 + x^3 - \frac{\left(7\,c^4\int \frac{x^6}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx - 10\,c^2\int \frac{x^4}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx + 3\int \frac{x^2}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx\right)\left(b^2c\arctan\left(cx,\sqrt{\cdots}\right)\right)}{bc}}{b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^7 - 2*c^2*x^5 + x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)) + a*b*c)*integrate((7*c^4*x^6 - 10*c^2*x^4 + 3*x^2)/(b^2*c*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(c^2x^5 - x^3\right)\sqrt{-c^2x^2+1}}{b^2\arcsin\left(cx\right)^2 + 2\,ab\arcsin\left(cx\right) + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^5 - x^3)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arc
sin(c*x) + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.74399, size = 2788, normalized size = 10.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -7*b*arcsin(c*x)*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 7*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(7
*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 7*a*cos(a/b)^7*co
s_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 7*a*c
os(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 49/4*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5/4*b*arcsin(c*x)*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 35/4*b
*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) - 5/4*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_int
egral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 49/4*a*cos
(a/b)^5*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^
4) - 5/4*a*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c
*x) + a*b^2*c^4) + 35/4*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5/4*a*cos(a/b)^4*sin(a/b)*sin_in
tegral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - (c^2*x^2
- 1)^3*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 49/8*b*arcsin(c*x)*cos(a/b
)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) +
 25/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
4*arcsin(c*x) + a*b^2*c^4) + 9/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a
/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/8*b*arcsin(c*x)*
cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x
```

```
) + a*b^2*c^4) + 15/16*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b
 + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 9/16*b*arcsin(c*x)*co
s(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
+ a*b^2*c^4) - (c^2*x^2 - 1)^2*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 49
/8*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
a*b^2*c^4) + 25/16*a*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
4*arcsin(c*x) + a*b^2*c^4) + 9/16*a*cos(a/b)^3*cos_integral(3*a/b + 3*arcsi
n(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/8*a*cos(a/b)^2*sin(a/b)*sin_
integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 15/16*a
*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*
x) + a*b^2*c^4) + 9/16*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(
c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 49/64*b*arcsin(c*x)*cos(a/b)*cos_
integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 25/64*b
*arcsin(c*x)*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c
*x) + a*b^2*c^4) - 27/64*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcs
in(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*b*arcsin(c*x)*cos(a/b)*co
s_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 7/64*b*ar
csin(c*x)*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) - 5/64*b*arcsin(c*x)*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c
*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/64*b*arcsin(c*x)*sin(a/b)*sin_in
tegral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*b*ar
csin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a
*b^2*c^4) + 49/64*a*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*a
rcsin(c*x) + a*b^2*c^4) - 25/64*a*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*
x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 27/64*a*cos(a/b)*cos_integral(3*a/b
 + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*a*cos(a/b)*cos_i
ntegral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 7/64*a*sin(a
/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) -
 5/64*a*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
 a*b^2*c^4) - 9/64*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*
arcsin(c*x) + a*b^2*c^4) + 3/64*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/
(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
```

3.391 $\int \frac{x^2\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=220

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16b^2c^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{4b^2c^3}-\frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6\left(a+b\sin^{-1}(c\right.}{b}\right.}{16b^2c^3}$$

```
[Out] -((x^2*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b
*ArcSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*(a + b*ArcSi
n[c*x]))/b]*Sin[(4*a)/b])/(4*b^2*c^3) - (3*CosIntegral[(6*(a + b*ArcSin[c*x
]))/b]*Sin[(6*a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*Arc
Sin[c*x]))/b])/(16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*
x]))/b])/(4*b^2*c^3) + (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/
b])/(16*b^2*c^3)
```

Rubi [A] time = 0.636239, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4721, 4723, 4406, 3303, 3299, 3302}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{16b^2c^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{4b^2c^3}-\frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6a}{b}+\right.}{16b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*a)/b +
 2*ArcSin[c*x]]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*a)/b + 4*ArcSi
n[c*x]]*Sin[(4*a)/b])/(4*b^2*c^3) - (3*CosIntegral[(6*a)/b + 6*ArcSin[c*x]]
*Sin[(6*a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[
c*x]])/(16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(
4*b^2*c^3) + (3*Cos[(6*a)/b]*SinIntegral[(6*a)/b + 6*ArcSin[c*x]])/(16*b^2*
c^3)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
```

```
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{x^2\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\int\frac{x\left(1-c^2x^2\right)}{a+b\sin^{-1}(cx)}\,dx}{bc}-\frac{(6c)\int\frac{x^3\left(1-c^2x^2\right)}{a+b\sin^{-1}(cx)}\,dx}{b} \\
&= -\frac{x^2\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\,\mathrm{Subst}\left(\int\frac{\cos^3(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{6\,\mathrm{Subst}\left(\int\frac{\cos^3(x)\sin^3(x)}{a+bx}\,dx,\right.}{bc^3} \\
&= -\frac{x^2\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\,\mathrm{Subst}\left(\int\left(\frac{\sin(2x)}{4(a+bx)}+\frac{\sin(4x)}{8(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{6\,\mathrm{Subst}\left(\int\left(\frac{3\sin(2x)}{32(a+bx)}\right.\right.}{} \\
&= -\frac{x^2\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\,\mathrm{Subst}\left(\int\frac{\sin(6x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{16bc^3}+\frac{\mathrm{Subst}\left(\int\frac{\sin(4x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4bc^3} \\
&= -\frac{x^2\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{2a}{b}\right)\mathrm{Subst}\left(\int\frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2bc^3}-\frac{\left(9\cos\left(\frac{2a}{b}\right)\right)\mathrm{Subst}\left(\right.}{} \\
&= -\frac{x^2\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\mathrm{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3}-\frac{\mathrm{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin\left(\frac{4a}{b}\right)}{4b^2c^3}-\frac{3\mathrm{Ci}}{}
\end{aligned}$$

Mathematica [A] time = 0.808738, size = 306, normalized size = 1.39

$$-\frac{-\sin\left(\frac{2a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\mathrm{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+4\sin\left(\frac{4a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\mathrm{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(c\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(16*b*c^2*x^2 - 32*b*c^4*x^4 + 16*b*c^6*x^6 - (a + b*ArcSin[c*x])*CosInteg
ral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] + 4*(a + b*ArcSin[c*x])*CosIntegral
[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 3*a*CosIntegral[6*(a/b + ArcSin[c*x]
)]*Sin[(6*a)/b] + 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcSin[c*x])]*Sin[(6
*a)/b] + a*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + b*ArcSin[c*x]*
Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - 4*a*Cos[(4*a)/b]*SinInteg
ral[4*(a/b + ArcSin[c*x])] - 4*b*ArcSin[c*x]*Cos[(4*a)/b]*SinIntegral[4*(a/
b + ArcSin[c*x])] - 3*a*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] - 3
*b*ArcSin[c*x]*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(16*b^2*c^3
*(a + b*ArcSin[c*x]))
```

Maple [A] time = 0.058, size = 364, normalized size = 1.7

$$\frac{1}{32\,c^{3}\left(a+b\arcsin\left(cx\right)\right)b^{2}}\left(8\arcsin\left(cx\right)\mathrm{Si}\left(4\arcsin\left(cx\right)+4\,\frac{a}{b}\right)\cos\left(4\,\frac{a}{b}\right)b-8\arcsin\left(cx\right)\mathrm{Ci}\left(4\arcsin\left(cx\right)+4\,\frac{a}{b}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/32/c^3*(8*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-8*arcsin(c*x)*
Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b-2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*
cos(2*a/b)*b+2*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+6*arcsin(c*
x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-6*arcsin(c*x)*Ci(6*arcsin(c*x)+6*a/
b)*sin(6*a/b)*b+8*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-8*Ci(4*arcsin(c*x)+4
*a/b)*sin(4*a/b)*a-2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a+2*Ci(2*arcsin(c*x
)+2*a/b)*sin(2*a/b)*a+6*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*a-6*Ci(6*arcsin(
c*x)+6*a/b)*sin(6*a/b)*a+2*cos(4*arcsin(c*x))*b-cos(2*arcsin(c*x))*b+cos(6*
arcsin(c*x))*b-2*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{c^{4}x^{6}-2\,c^{2}x^{4}+x^{2}-2\left(b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int\frac{3\,c^{4}x^{5}-4\,c^{2}x^{3}+x}{b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}\,dx}{b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^6 - 2*c^2*x^4 + x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)) + a*b*c)*integrate(2*(3*c^4*x^5 - 4*c^2*x^3 + x)/(b^2*c*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(c^{2}x^{4}-x^{2}\right)\sqrt{-c^{2}x^{2}+1}}{b^{2}\arcsin\left(cx\right)^{2}+2\,ab\arcsin\left(cx\right)+a^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^4 - x^2)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arc
sin(c*x) + a^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2 \left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.70175, size = 2097, normalized size = 9.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6
*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 6*a*cos(a/b)^5*co
s_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + 6*a*cos(a/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x)
 + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*
x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^3
*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*
c^3) - 9*b*arcsin(c*x)*cos(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*
c^3*arcsin(c*x) + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/
b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^3*cos_i
ntegral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) -
 2*a*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) - 9*a*cos(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*a*cos(a/b)^4*sin_integral(4*a/b + 4*arc
sin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/8*b*arcsin(c*x)*cos(a/b)*co
s_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^
3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(2*
a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 27/8*b*ar
csin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*
x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(
c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*b*arcsin(c*x)*cos(a/b)^2*sin_
integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - (c^2*x^
2 - 1)^3*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/8*a*cos(a/b)*cos_integral(
6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + a*cos(a
/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b
^2*c^3) + 1/8*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*
```

```
c^3*arcsin(c*x) + a*b^2*c^3) + 27/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arc
sin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^2*sin_integral(4
*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*a*cos(a/b)^2*
sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - (c^
2*x^2 - 1)^2*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3/16*b*arcsin(c*x)*sin_i
ntegral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*ar
csin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*
c^3) + 1/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcs
in(c*x) + a*b^2*c^3) - 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*
arcsin(c*x) + a*b^2*c^3) + 1/4*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(2*a/b + 2*arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

3.392 $\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=214

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8b^2c^2}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{16b^2c^2}+\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\sin^{-1}(cx))}{b}\right)}{16b^2c^2}$$

```
[Out] -((x*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(8*b^2*c^2) + (9*Cos[(3*a)/b]*CosIntegral[(3*(a + b*A
rcSin[c*x]))/b])/(16*b^2*c^2) + (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b])/(16*b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(
8*b^2*c^2) + (9*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^
2*c^2) + (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^
2)
```

Rubi [A] time = 0.666335, antiderivative size = 210, normalized size of antiderivative = 0.98, number of steps used = 22, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4721, 4661, 3312, 3303, 3299, 3302, 4723, 4406}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^2}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16b^2c^2}+\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}+5\sin\right.}{16b^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[a/
b + ArcSin[c*x]])/(8*b^2*c^2) + (9*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3*Arc
Sin[c*x]])/(16*b^2*c^2) + (5*Cos[(5*a)/b]*CosIntegral[(5*a)/b + 5*ArcSin[c*
x]])/(16*b^2*c^2) + (Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(8*b^2*c^2) +
 (9*Sin[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b^2*c^2) + (5*Si
n[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b^2*c^2)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{x\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\int \frac{1-c^2x^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(5c)\int \frac{x^2\left(1-c^2x^2\right)}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Subst}\left(\int \frac{\cos^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{5\,\text{Subst}\left(\int \frac{\cos^3(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}\right.}{bc^2}$$

$$= -\frac{x\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Subst}\left(\int \left(\frac{3\cos(x)}{4(a+bx)} + \frac{\cos(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{5\,\text{Subst}\left(\int \left(\frac{\cos(x)}{8(a+bx)} - \right.\right.}{}$$

$$= -\frac{x\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4bc^2} + \frac{5\,\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x, \sin^{-1}(cx\right.}{16bc^2}$$

$$= -\frac{x\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8bc^2} + \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\right.}{}$$

$$= -\frac{x\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^2} + \frac{9\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16b^2c^2} + \frac{5\cos}{}$$

Mathematica [A] time = 0.516958, size = 295, normalized size = 1.38

$$\frac{2\cos\left(\frac{a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) + 9\cos\left(\frac{3a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) +}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-16*b*c*x + 32*b*c^3*x^3 - 16*b*c^5*x^5 + 2*(a + b*ArcSin[c*x])*Cos[a/b]*C
osIntegral[a/b + ArcSin[c*x]] + 9*(a + b*ArcSin[c*x])*Cos[(3*a)/b]*CosInteg
ral[3*(a/b + ArcSin[c*x])] + 5*a*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c
*x])] + 5*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 2
*a*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 2*b*ArcSin[c*x]*Sin[a/b]*SinIn
tegral[a/b + ArcSin[c*x]] + 9*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*
x])] + 9*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*
a*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + 5*b*ArcSin[c*x]*Sin[(5*
a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b^2*c^2*(a + b*ArcSin[c*x]))
```

Maple [A] time = 0.051, size = 341, normalized size = 1.6

$$\frac{1}{16\,c^2\left(a+b\arcsin(cx)\right)b^2}\left(9\arcsin(cx)\,\text{Si}\left(3\arcsin(cx)+3\,\frac{a}{b}\right)\sin\left(3\,\frac{a}{b}\right)b + 9\arcsin(cx)\,\text{Ci}\left(3\arcsin(cx)+3\,\frac{a}{b}\right)\cos\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/16/c^2*(9*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+9*arcsin(c*x)*
Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+2*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(
a/b)*b+2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+5*arcsin(c*x)*sin(5*a/b
```

```
)*Si(5*arcsin(c*x)+5*a/b)*b+5*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b
)*b+9*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+9*Ci(3*arcsin(c*x)+3*a/b)*cos(3*
a/b)*a+2*Si(arcsin(c*x)+a/b)*sin(a/b)*a+2*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+5*
sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a
-2*x*b*c-3*sin(3*arcsin(c*x))*b-sin(5*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{c^4x^5 - 2\,c^2x^3 + x - \frac{\left(5\,c^4 \int \frac{x^4}{b \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx - 6\,c^2 \int \frac{x^2}{b \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx + \int \frac{1}{b \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx\right)\left(b^2 c \arctan\left(cx, \sqrt{\right.\right.}{bc}}{b^2 c \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^5 - 2*c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 a*b*c)*integrate((5*c^4*x^4 - 6*c^2*x^2 + 1)/(b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c), x) + x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(c^2x^3 - x\right)\sqrt{-c^2x^2 + 1}}{b^2 \arcsin\left(cx\right)^2 + 2\,ab \arcsin\left(cx\right) + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^3 - x)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsi
n(c*x) + a^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(-\left(cx - 1\right)\left(cx + 1\right)\right)^{\frac{3}{2}}}{\left(a + b \operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.70941, size = 1640, normalized size = 7.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] 5*b*arcsin(c*x)*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 5*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(5*
a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5*a*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5*a*co
s(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) - 25/4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(
c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 9/4*b*arcsin(c*x)*cos(a/b)^3*cos_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 15/4*b*
arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
2*arcsin(c*x) + a*b^2*c^2) + 9/4*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - (c^2*x^2 -
1)^2*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 25/4*a*cos(a/b)^3*cos_integr
al(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 9/4*a*cos(a/b
)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) -
 15/4*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*ar
csin(c*x) + a*b^2*c^2) + 9/4*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*a
rcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/16*b*arcsin(c*x)*cos(a/b
)*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 2
7/16*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*ar
csin(c*x) + a*b^2*c^2) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/16*b*arcsin(c*x)*sin(a/b)*si
n_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 9/16*
b*arcsin(c*x)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 1/8*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*
x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/16*a*cos(a/b)*cos_integral(5*a/b
 + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/16*a*cos(a/b)*cos_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/8*a*c
os(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) +
 5/16*a*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) +
 a*b^2*c^2) - 9/16*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*
arcsin(c*x) + a*b^2*c^2) + 1/8*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(
b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

3.393 $\int \frac{\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=150

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c}+\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c}-\frac{\cos\left(\frac{4a}{b}\right)\ldots}{}$$

```
[Out] -((1 - c^2*x^2)^2/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b*ArcSi
n[c*x]))/b]*Sin[(2*a)/b])/(b^2*c) + (CosIntegral[(4*(a + b*ArcSin[c*x]))/b]
*Sin[(4*a)/b])/(2*b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x])
)/b])/(b^2*c) - (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(2*b^
2*c)
```

Rubi [A] time = 0.272936, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {4659, 4723, 4406, 3303, 3299, 3302}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c}+\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{2b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c}\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*a)/b + 2*Arc
Sin[c*x]]*Sin[(2*a)/b])/(b^2*c) + (CosIntegral[(4*a)/b + 4*ArcSin[c*x]]*Sin
[(4*a)/b])/(2*b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/
(b^2*c) - (Cos[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(2*b^2*c)
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{(4c)\int \frac{x\left(1-c^2x^2\right)}{a+b\sin^{-1}(cx)}\,dx}{b}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{4\,\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{4\,\text{Subst}\left(\int \left(\frac{\sin(2x)}{4(a+bx)}+\frac{\sin(4x)}{8(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\text{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2bc} - \frac{\text{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin}{}\right.}{2}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c} + \frac{\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin\left(\frac{4a}{b}\right)}{2b^2c} - \frac{\cos}{}
\end{aligned}$$

Mathematica [A] time = 0.623514, size = 122, normalized size = 0.81

$$\frac{-\frac{2b\left(c^2x^2-1\right)^2}{a+b\sin^{-1}(cx)} + 2\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) + \sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) - 2\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\right.}{2b^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-2*b*(-1 + c^2*x^2)^2)/(a + b*ArcSin[c*x]) + 2*CosIntegral[2*(a/b + ArcSi
n[c*x])]*Sin[(2*a)/b] + CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 2
*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral
[4*(a/b + ArcSin[c*x])])/(2*b^2*c)
```

Maple [A] time = 0.048, size = 250, normalized size = 1.7

$$-\frac{1}{8c\left(a+b\arcsin\left(cx\right)\right)b^{2}}\left(4\arcsin\left(cx\right)\operatorname{Si}\left(4\arcsin\left(cx\right)+4\frac{a}{b}\right)\cos\left(4\frac{a}{b}\right)b-4\arcsin\left(cx\right)\operatorname{Ci}\left(4\arcsin\left(cx\right)+4\frac{a}{b}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/8/c*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*Ci
(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+8*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*co
s(2*a/b)*b-8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+4*Si(4*arcsin
(c*x)+4*a/b)*cos(4*a/b)*a-4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+8*Si(2*arc
sin(c*x)+2*a/b)*cos(2*a/b)*a-8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(4*a
rcsin(c*x))*b+4*cos(2*arcsin(c*x))*b+3*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{c^{4}x^{4}-2\,c^{2}x^{2}-4\left(b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int\frac{c^{3}x^{3}-cx}{b^{2}\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ab}\,dx+1}{b^{2}c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 a*b*c)*integrate(4*(c^3*x^3 - c*x)/(b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b), x) + 1)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
+ a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^{2}x^{2}+1\right)^{\frac{3}{2}}}{b^{2}\arcsin\left(cx\right)^{2}+2\,ab\arcsin\left(cx\right)+a^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.6512, size = 1008, normalized size = 6.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^
3*c*arcsin(c*x) + a*b^2*c) - 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b
+ 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*a*cos(a/b)^3*cos_integra
l(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 4*a*cos(a
/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2
*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c
*arcsin(c*x) + a*b^2*c) + 2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*a
rcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*b*arcsin(c*x)*cos(a/
b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*
b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(
c*x) + a*b^2*c) - 2*a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)
/(b^3*c*arcsin(c*x) + a*b^2*c) + 2*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin
(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*a*cos(a/b)^2*sin_integral
(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*a*cos(a/b)^2*sin_
integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - (c^2*x^2 -
1)^2*b/(b^3*c*arcsin(c*x) + a*b^2*c) - 1/2*b*arcsin(c*x)*sin_integral(4*a/b
 + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + b*arcsin(c*x)*sin_integra
l(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 1/2*a*sin_integral
(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + a*sin_integral(2*a/
b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
```

3.394 $\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=176

$$-\frac{\text{Unintegrable}\left(\frac{1-c^2x^2}{x^2\left(a+b\sin^{-1}(cx)\right)},x\right)}{bc}-\frac{9\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b^2}-\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{4b^2}$$

```
[Out] -((1 - c^2*x^2)^2/(b*c*x*(a + b*ArcSin[c*x]))) - (9*Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(4*b^2) - (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSi
n[c*x]))/b])/(4*b^2) - (9*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b
^2) - (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2) - Uni
ntegrable[(1 - c^2*x^2)/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi [A] time = 0.403718, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x*(a + b*ArcSin[c*x]))) - (9*Cos[a/b]*CosIntegral[a/
b + ArcSin[c*x]])/(4*b^2) - (3*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3*ArcSin[
c*x]])/(4*b^2) - (9*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b^2) - (3*S
in[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(4*b^2) - Defer[Int][(1 -
 c^2*x^2)/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{\left(1-c^2x^2\right)^2}{bcx\left(a+b\sin^{-1}(cx)\right)} - \frac{\int \frac{1-c^2x^2}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc} - \frac{(3c)\int \frac{1-c^2x^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{\left(1-c^2x^2\right)^2}{bcx\left(a+b\sin^{-1}(cx)\right)} - \frac{3\,\text{Subst}\left(\int \frac{\cos^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{\int \frac{1-c^2x^2}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

$$= -\frac{\left(1-c^2x^2\right)^2}{bcx\left(a+b\sin^{-1}(cx)\right)} - \frac{3\,\text{Subst}\left(\int \left(\frac{3\cos(x)}{4(a+bx)} + \frac{\cos(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{b} - \frac{\int \frac{1-c^2x^2}{x^2\left(a+b\sin^{-1}(cx)\right)}}{bc}$$

$$= -\frac{\left(1-c^2x^2\right)^2}{bcx\left(a+b\sin^{-1}(cx)\right)} - \frac{3\,\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4b} - \frac{9\,\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \sin^{-1}\right.}{4b}$$

$$= -\frac{\left(1-c^2x^2\right)^2}{bcx\left(a+b\sin^{-1}(cx)\right)} - \frac{\int \frac{1-c^2x^2}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc} - \frac{\left(9\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx\right.}{4b}$$

$$= -\frac{\left(1-c^2x^2\right)^2}{bcx\left(a+b\sin^{-1}(cx)\right)} - \frac{9\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2} - \frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4b^2} - \ldots$$

Mathematica [A] time = 10.3348, size = 0, normalized size = 0.

$$\int \frac{\left(1-c^2x^2\right)^{3/2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.343, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x)

[Out] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{c^4x^4 - 2c^2x^2 - \frac{\left(b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx\right)\left(3c^4\int \frac{x^4}{bx^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ax^2}\,dx - 2c^2\int \frac{x^2}{bx^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ax^2}\,dx - \int \frac{}{bx^2\arctan\ldots}\right.}{bc}}{b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
 + a*b*c*x)*integrate((3*c^4*x^4 - 2*c^2*x^2 - 1)/(b^2*c*x^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) + 1)/(b^2*c*x*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{b^2x\arcsin\left(cx\right)^2+2\,abx\arcsin\left(cx\right)+a^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
a^2*x), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x), x)
```

3.395 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=100

$$-\frac{2\text{Unintegrable}\left(\frac{1-c^2x^2}{x^3(a+b\sin^{-1}(cx))},x\right)}{bc}-\frac{2c\text{Unintegrable}\left(\frac{1-c^2x^2}{x(a+b\sin^{-1}(cx))},x\right)}{b}-\frac{(1-c^2x^2)^2}{bcx^2(a+b\sin^{-1}(cx))}$$

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Unintegrable[(1 - c^2
*x^2)/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (2*c*Unintegrable[(1 - c^2*x^2
)/(x*(a + b*ArcSin[c*x])), x])/b
```

Rubi [A] time = 0.24623, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][(1 - c^2*x
^2)/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (2*c*Defer[Int][(1 - c^2*x^2)/(x
*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\sin^{-1}(cx))^2}\,dx=-\frac{(1-c^2x^2)^2}{bcx^2(a+b\sin^{-1}(cx))}-\frac{2\int \frac{1-c^2x^2}{x^3(a+b\sin^{-1}(cx))}\,dx}{bc}-\frac{(2c)\int \frac{1-c^2x^2}{x(a+b\sin^{-1}(cx))}\,dx}{b}$$

Mathematica [A] time = 4.34198, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.341, size = 0, normalized size = 0.

$$\int \frac{1}{x^2(a+b\arcsin(cx))^2}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{c^4x^4 - 2\,c^2x^2 - 2\left(b^2cx^2 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^2\right)\int \frac{c^4x^4-1}{b^2cx^3 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^3}\,dx + 1}{b^2cx^2 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^2)*integrate(2*(c^4*x^4 - 1)/(b^2*c*x^3*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c*x^3), x) + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{b^2x^2 \arcsin\left(cx\right)^2 + 2\,abx^2 \arcsin\left(cx\right) + a^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x
) + a^2*x^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x^2\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**2*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{\left(b \arcsin\left(cx\right) + a\right)^2 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x^2), x)
```

3.396 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.140476, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2),x]

[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 15.9246, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.921, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{c^4x^4-2\,c^2x^2-\frac{\left(b^2cx^3\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^3\right)\left(c^4\int\frac{x^4}{bx^4\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ax^4}\,dx+2\,c^2\int\frac{x^2}{bx^4\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ax^4}\,dx-3\int\frac{}{bx^4\arctan}\right.}{bc}}{b^2cx^3\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^3)*integrate((c^4*x^4 + 2*c^2*x^2 - 3)/(b^2*c*x^4*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4), x) + 1)/(b^2*c*x^3*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{b^2x^3\arcsin\left(cx\right)^2+2\,abx^3\arcsin\left(cx\right)+a^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x
) + a^2*x^3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x^3\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**3*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x^3), x)
```

3.397 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=68

$$-\frac{4\text{Unintegrable}\left(\frac{1-c^2x^2}{x^5(a+b\sin^{-1}(cx))},x\right)}{bc}-\frac{(1-c^2x^2)^2}{bcx^4\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^4*(a + b*ArcSin[c*x]))) - (4*Unintegrable[(1 - c^2
*x^2)/(x^5*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi [A] time = 0.197467, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^4*(a + b*ArcSin[c*x]))) - (4*Defer[Int][(1 - c^2*x
^2)/(x^5*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{(1-c^2x^2)^2}{bcx^4\left(a+b\sin^{-1}(cx)\right)}-\frac{4\int \frac{1-c^2x^2}{x^5(a+b\sin^{-1}(cx))}\,dx}{bc}$$

Mathematica [A] time = 2.62552, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 4.744, size = 0, normalized size = 0.

$$\int \frac{1}{x^4\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{c^4x^4 - 2c^2x^2 - 4\left(b^2cx^4\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^4\right)\int \frac{c^2x^2-1}{b^2cx^5\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^5}\,dx + 1}{b^2cx^4\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^4)*integrate(4*(c^2*x^2 - 1)/(b^2*c*x^5*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c*x^5), x) + 1)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x^4)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{b^2x^4\arcsin\left(cx\right)^2 + 2\,abx^4\arcsin\left(cx\right) + a^2x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x
) + a^2*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**4/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x^4), x)
```

3.398 $\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{\left(1-c^2x^2\right)^{5/2}x^m}{\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi [A] time = 0.136872, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 0.562187, size = 0, normalized size = 0.

$$\int \frac{x^m\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 0.935, size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4 - 2\,c^2x^2 + 1\right)\sqrt{-c^2x^2 + 1}x^m}{b^2\arcsin\left(cx\right)^2 + 2\,ab\arcsin\left(cx\right) + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^
2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2 + 1\right)^{\frac{5}{2}}x^m}{\left(b\arcsin\left(cx\right) + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^m/(b*arcsin(c*x) + a)^2, x)
```

3.399 $\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2} dx$

Optimal. Leaf size=278

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{128b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{32b^2c^4}-\frac{21\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\sin^{-1}}{b}\right.}{256b^2c^4}$$

```
[Out] -((x^3*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[(a + b*ArcSin[c*x])/b])/(128*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a
 + b*ArcSin[c*x]))/b])/(32*b^2*c^4) - (21*Cos[(7*a)/b]*CosIntegral[(7*(a +
b*ArcSin[c*x]))/b])/(256*b^2*c^4) - (9*Cos[(9*a)/b]*CosIntegral[(9*(a + b*A
rcSin[c*x]))/b])/(256*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x]
)/b])/(128*b^2*c^4) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(32*b^2*c^4) - (21*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/
(256*b^2*c^4) - (9*Sin[(9*a)/b]*SinIntegral[(9*(a + b*ArcSin[c*x]))/b])/(25
6*b^2*c^4)
```

Rubi [A] time = 1.15499, antiderivative size = 274, normalized size of antiderivative = 0.99, number of steps used = 34, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4721, 4723, 4406, 3303, 3299, 3302}

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{128b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{32b^2c^4}-\frac{21\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7a}{b}\right.}{256b^2c^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[a/b + ArcSin[c*x]])/(128*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*a)/b +
 3*ArcSin[c*x]])/(32*b^2*c^4) - (21*Cos[(7*a)/b]*CosIntegral[(7*a)/b + 7*Ar
cSin[c*x]])/(256*b^2*c^4) - (9*Cos[(9*a)/b]*CosIntegral[(9*a)/b + 9*ArcSin[
c*x]])/(256*b^2*c^4) + (3*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(128*b^2
*c^4) + (3*Sin[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(32*b^2*c^4)
- (21*Sin[(7*a)/b]*SinIntegral[(7*a)/b + 7*ArcSin[c*x]])/(256*b^2*c^4) - (9
*Sin[(9*a)/b]*SinIntegral[(9*a)/b + 9*ArcSin[c*x]])/(256*b^2*c^4)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
```

```
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^3\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\int \frac{x^2\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(9c)\int \frac{x^4\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\,\text{Subst}\left(\int \frac{\cos^5(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{9\,\text{Subst}\left(\int \frac{\cos^5(x)\sin^4(x)}{a+bx}\,dx\right.}{bc^4}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\,\text{Subst}\left(\int \left(\frac{5\cos(x)}{64(a+bx)} - \frac{\cos(3x)}{64(a+bx)} - \frac{3\cos(5x)}{64(a+bx)} - \frac{\cos(7x)}{64(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^4}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{9\,\text{Subst}\left(\int \frac{\cos(7x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{256bc^4} - \frac{9\,\text{Subst}\left(\int \frac{\cos(9x)}{a+bx}\,dx, x, \sin^{-1}(c\right.}{256bc^4}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(27\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{128bc^4} + \frac{\left(15\cos\left(\frac{a}{b}\right)\right)\text{Subst}}{}$$

$$= -\frac{x^3\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{128b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{32b^2c^4} - \frac{21}{}$$

Mathematica [A] time = 1.50773, size = 408, normalized size = 1.47

$$-\frac{-6\cos\left(\frac{a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) - 24\cos\left(\frac{3a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(256*b*c^3*x^3 - 768*b*c^5*x^5 + 768*b*c^7*x^7 - 256*b*c^9*x^9 - 6*(a + b*
ArcSin[c*x])*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - 24*(a + b*ArcSin[c*x
])*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + 21*a*Cos[(7*a)/b]*CosI
ntegral[7*(a/b + ArcSin[c*x])] + 21*b*ArcSin[c*x]*Cos[(7*a)/b]*CosIntegral[
7*(a/b + ArcSin[c*x])] + 9*a*Cos[(9*a)/b]*CosIntegral[9*(a/b + ArcSin[c*x])
] + 9*b*ArcSin[c*x]*Cos[(9*a)/b]*CosIntegral[9*(a/b + ArcSin[c*x])] - 6*a*S
in[a/b]*SinIntegral[a/b + ArcSin[c*x]] - 6*b*ArcSin[c*x]*Sin[a/b]*SinIntegr
al[a/b + ArcSin[c*x]] - 24*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])
] - 24*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 21*a
*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] + 21*b*ArcSin[c*x]*Sin[(7*
a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] + 9*a*Sin[(9*a)/b]*SinIntegral[9*(
a/b + ArcSin[c*x])] + 9*b*ArcSin[c*x]*Sin[(9*a)/b]*SinIntegral[9*(a/b + Arc
Sin[c*x])])/(256*b^2*c^4*(a + b*ArcSin[c*x]))
```

Maple [A] time = 0.06, size = 455, normalized size = 1.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/256/c^4*(21*arcsin(c*x)*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*b-6*arcsin(c*
x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+9*arcsin(c*x)*Si(9*arcsin(c*x)+9*a/b)*sin
(9*a/b)*b+9*arcsin(c*x)*Ci(9*arcsin(c*x)+9*a/b)*cos(9*a/b)*b-24*arcsin(c*x)
*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b-24*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b
)*cos(3*a/b)*b+21*arcsin(c*x)*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*b-6*arcsin
(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+21*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*
a-6*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+9*Si(9*arcsin(c*x)+9*a/b)*sin(9*a/b)*a+9
*Ci(9*arcsin(c*x)+9*a/b)*cos(9*a/b)*a-24*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)
*a-24*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+21*Si(7*arcsin(c*x)+7*a/b)*sin(7
*a/b)*a-6*Si(arcsin(c*x)+a/b)*sin(a/b)*a+6*x*b*c-sin(9*arcsin(c*x))*b+8*sin
(3*arcsin(c*x))*b-3*sin(7*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^6x^9 - 3\,c^4x^7 + 3\,c^2x^5 - x^3 - 3\left(b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc\right)\int \frac{3\,c^6x^8 - 7\,c^4x^6 + 5\,c^2x^4 - x^2}{b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc}\,dx}{b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^9 - 3*c^4*x^7 + 3*c^2*x^5 - x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + a*b*c)*integrate(3*(3*c^6*x^8 - 7*c^4*x^6 + 5*c^2*x^4 - x
^2)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^7-2\,c^2x^5+x^3\right)\sqrt{-c^2x^2+1}}{b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^7 - 2*c^2*x^5 + x^3)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2
+ 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.7738, size = 3347, normalized size = 12.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -9*b*arcsin(c*x)*cos(a/b)^9*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 9*b*arcsin(c*x)*cos(a/b)^8*sin(a/b)*sin_integral(9
*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9*a*cos(a/b)^9*co
s_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9*a*c
os(a/b)^8*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 81/4*b*arcsin(c*x)*cos(a/b)^7*cos_integral(9*a/b + 9*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*b*arcsin(c*x)*cos(a/b)^7*co
s_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 63/4*
b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*
c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_i
ntegral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 81/4*a*c
os(a/b)^7*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*
c^4) - 21/4*a*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 63/4*a*cos(a/b)^6*sin(a/b)*sin_integral(9*a/b + 9*arc
sin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*a*cos(a/b)^6*sin(a/b)*si
n_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 243/1
6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arc
sin(c*x) + a*b^2*c^4) + 147/16*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b
+ 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 135/16*b*arcsin(c*x)*c
os(a/b)^4*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 105/16*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b
 + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 - 1)^4*b*c*x
/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 243/16*a*cos(a/b)^5*cos_integral(9*a/b
```

```
 + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147/16*a*cos(a/b)^5*c
os_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 135/
16*a*cos(a/b)^4*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 105/16*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*a
rcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 - 1)^3*b*c*x/(b^3*
c^4*arcsin(c*x) + a*b^2*c^4) + 135/32*b*arcsin(c*x)*cos(a/b)^3*cos_integral
(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 147/32*b*arcsin
(c*x)*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
 a*b^2*c^4) + 3/8*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*
x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 45/32*b*arcsin(c*x)*cos(a/b)^2*sin(
a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
- 63/32*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x
))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/8*b*arcsin(c*x)*cos(a/b)^2*sin(a/b
)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 1
35/32*a*cos(a/b)^3*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) - 147/32*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^
3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/8*a*cos(a/b)^3*cos_integral(3*a/b + 3*ar
csin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 45/32*a*cos(a/b)^2*sin(a/b)*
sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 63/
32*a*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 3/8*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcs
in(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 81/256*b*arcsin(c*x)*cos(a/b)*
cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147
/256*b*arcsin(c*x)*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 9/32*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3
*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*b*arcsin(c*x)*cos(a
/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/2
56*b*arcsin(c*x)*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcs
in(c*x) + a*b^2*c^4) + 21/256*b*arcsin(c*x)*sin(a/b)*sin_integral(7*a/b + 7
*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 3/32*b*arcsin(c*x)*sin(a/
b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) +
3/128*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) - 81/256*a*cos(a/b)*cos_integral(9*a/b + 9*arcsin(c*x))
/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147/256*a*cos(a/b)*cos_integral(7*a/b
+ 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/32*a*cos(a/b)*cos_in
tegral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*a*c
os(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) -
 9/256*a*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
+ a*b^2*c^4) + 21/256*a*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) - 3/32*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*a*sin(a/b)*sin_integral(a/
b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
```

3.400 $\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2} dx$

Optimal. Leaf size=282

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\sin^{-1}(cx))}{b}\right)}{16b^2c^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\sin^{-1}(cx))}{b}\right)}{8b^2c^3}-\frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\sin^{-1}(cx))}{b}\right)}{16b^2c^3}$$

```
[Out] -((x^2*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b
*ArcSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*(a + b*ArcSi
n[c*x]))/b]*Sin[(4*a)/b])/(8*b^2*c^3) - (3*CosIntegral[(6*(a + b*ArcSin[c*x
]))/b]*Sin[(6*a)/b])/(16*b^2*c^3) - (CosIntegral[(8*(a + b*ArcSin[c*x]))/b]
*Sin[(8*a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*
x]))/b])/(16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b
])/(8*b^2*c^3) + (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(1
6*b^2*c^3) + (Cos[(8*a)/b]*SinIntegral[(8*(a + b*ArcSin[c*x]))/b])/(16*b^2*
c^3)
```

Rubi [A] time = 0.933367, antiderivative size = 282, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4721, 4723, 4406, 3303, 3299, 3302}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{16b^2c^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8b^2c^3}-\frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6a}{b}+6\sin^{-1}(cx)\right)}{16b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*a)/b +
 2*ArcSin[c*x]]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*a)/b + 4*ArcSi
n[c*x]]*Sin[(4*a)/b])/(8*b^2*c^3) - (3*CosIntegral[(6*a)/b + 6*ArcSin[c*x]]
*Sin[(6*a)/b])/(16*b^2*c^3) - (CosIntegral[(8*a)/b + 8*ArcSin[c*x]]*Sin[(8*
a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(
16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(8*b^2*c^
3) + (3*Cos[(6*a)/b]*SinIntegral[(6*a)/b + 6*ArcSin[c*x]])/(16*b^2*c^3) + (
Cos[(8*a)/b]*SinIntegral[(8*a)/b + 8*ArcSin[c*x]])/(16*b^2*c^3)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
```

```
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^2\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^2\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\int \frac{x\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{bc}-\frac{(8c)\int \frac{x^3\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^2\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\,\text{Subst}\left(\int \frac{\cos^5(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{8\,\text{Subst}\left(\int \frac{\cos^5(x)\sin^3(x)}{a+bx}\right.}{bc^3}$$

$$= -\frac{x^2\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\,\text{Subst}\left(\int \left(\frac{5\sin(2x)}{32(a+bx)}+\frac{\sin(4x)}{8(a+bx)}+\frac{\sin(6x)}{32(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{bc^3}-8\,\text{Sul}$$

$$= -\frac{x^2\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Subst}\left(\int \frac{\sin(6x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{16bc^3}+\frac{\text{Subst}\left(\int \frac{\sin(8x)}{a+bx}\,dx,x,\sin^{-1}(cx\right.}{16bc^3}$$

$$= -\frac{x^2\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\left(5\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{16bc^3}-\frac{\left(3\cos\left(\frac{2a}{b}\right)\right)\text{S}}{}$$

$$= -\frac{x^2\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3}-\frac{\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin\left(\frac{4a}{b}\right)}{8b^2c^3}-$$

Mathematica [A] time = 1.08187, size = 414, normalized size = 1.47

$$\sin\left(\frac{2a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-2\sin\left(\frac{4a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(c\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-16*b*c^2*x^2 + 48*b*c^4*x^4 - 48*b*c^6*x^6 + 16*b*c^8*x^8 + (a + b*ArcSin
[c*x])*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] - 2*(a + b*ArcSin[c*
x])*CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 3*a*CosIntegral[6*(a/
b + ArcSin[c*x])]*Sin[(6*a)/b] - 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcSi
n[c*x])]*Sin[(6*a)/b] - a*CosIntegral[8*(a/b + ArcSin[c*x])]*Sin[(8*a)/b] -
 b*ArcSin[c*x]*CosIntegral[8*(a/b + ArcSin[c*x])]*Sin[(8*a)/b] - a*Cos[(2*a
)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - b*ArcSin[c*x]*Cos[(2*a)/b]*SinInt
egral[2*(a/b + ArcSin[c*x])] + 2*a*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin
[c*x])] + 2*b*ArcSin[c*x]*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] +
 3*a*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + 3*b*ArcSin[c*x]*Cos[
(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + a*Cos[(8*a)/b]*SinIntegral[8*
(a/b + ArcSin[c*x])] + b*ArcSin[c*x]*Cos[(8*a)/b]*SinIntegral[8*(a/b + ArcS
in[c*x])])/(16*b^2*c^3*(a + b*ArcSin[c*x]))
```

Maple [A] time = 0.061, size = 478, normalized size = 1.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/128/c^3*(16*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-16*arcsin(c*
x)*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+8*arcsin(c*x)*Si(8*arcsin(c*x)+8*a/
b)*cos(8*a/b)*b-8*arcsin(c*x)*Ci(8*arcsin(c*x)+8*a/b)*sin(8*a/b)*b-8*arcsin
(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b+8*arcsin(c*x)*Ci(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*b+24*arcsin(c*x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-24*a
rcsin(c*x)*Ci(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*b+16*Si(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)*a-16*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+8*Si(8*arcsin(c*x)+8*a
/b)*cos(8*a/b)*a-8*Ci(8*arcsin(c*x)+8*a/b)*sin(8*a/b)*a-8*Si(2*arcsin(c*x)+
2*a/b)*cos(2*a/b)*a+8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+24*Si(6*arcsin(c
*x)+6*a/b)*cos(6*a/b)*a-24*Ci(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*a+4*cos(4*arc
sin(c*x))*b+cos(8*arcsin(c*x))*b-4*cos(2*arcsin(c*x))*b+4*cos(6*arcsin(c*x)
)*b-5*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^6x^8 - 3\,c^4x^6 + 3\,c^2x^4 - x^2 - 2\left(b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc\right)\int \frac{4\,c^6x^7 - 9\,c^4x^5 + 6\,c^2x^3 - x}{b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc}\,dx}{b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^8 - 3*c^4*x^6 + 3*c^2*x^4 - x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + a*b*c)*integrate(2*(4*c^6*x^7 - 9*c^4*x^5 + 6*c^2*x^3 - x
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(c^4x^6 - 2c^2x^4 + x^2)\sqrt{-c^2x^2 + 1}}{b^2 \arcsin(cx)^2 + 2ab \arcsin(cx) + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^6 - 2*c^2*x^4 + x^2)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2
+ 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.8185, size = 3322, normalized size = 11.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -8*b*arcsin(c*x)*cos(a/b)^7*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 8*b*arcsin(c*x)*cos(a/b)^8*sin_integral(8
*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 8*a*cos(a/b)^7*co
s_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + 8*a*cos(a/b)^8*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x)
 + a*b^2*c^3) + 12*b*arcsin(c*x)*cos(a/b)^5*cos_integral(8*a/b + 8*arcsin(c
*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 6*b*arcsin(c*x)*cos(a/b)^
5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2
*c^3) - 16*b*arcsin(c*x)*cos(a/b)^6*sin_integral(8*a/b + 8*arcsin(c*x))/(b^
3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*
a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 12*a*cos(a/b)^5*co
s_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) - 6*a*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*ar
csin(c*x) + a*b^2*c^3) - 16*a*cos(a/b)^6*sin_integral(8*a/b + 8*arcsin(c*x)
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^6*sin_integral(6*a/b + 6
*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 5*b*arcsin(c*x)*cos(a/b)^
3*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2
*c^3) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(
a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - b*arcsin(c*x)*cos(a/b)^3*cos_integ
ral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 10*
b*arcsin(c*x)*cos(a/b)^4*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) - 9*b*arcsin(c*x)*cos(a/b)^4*sin_integral(6*a/b + 6*arc
```

```
sin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*arcsin(c*x)*cos(a/b)^4*sin_
integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 5*a*cos
(a/b)^3*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) + 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(
b^3*c^3*arcsin(c*x) + a*b^2*c^3) - a*cos(a/b)^3*cos_integral(4*a/b + 4*arcs
in(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 10*a*cos(a/b)^4*sin_i
ntegral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9*a*cos(
a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) + (c^2*x^2 - 1)^4*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*b*a
rcsin(c*x)*cos(a/b)*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) - 9/8*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6
*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*b*arcsin(c*x
)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x
) + a*b^2*c^3) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c
*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^
2*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2
7/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) - b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*a
rcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*b*arcsin(c*x)*cos(a/b)^
2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + (
c^2*x^2 - 1)^3*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*a*cos(a/b)*cos_int
egral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9
/8*a*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(
c*x) + a*b^2*c^3) + 1/2*a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(
a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*cos(a/b)*cos_integral(2*a/b
+ 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^
2*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2
7/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) - a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arc
sin(c*x) + a*b^2*c^3) - 1/8*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x)
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*b*arcsin(c*x)*sin_integral(8*a/b
 + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3/16*b*arcsin(c*x)*si
n_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*b
*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b
^2*c^3) + 1/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) - 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*sin_integral(4*a/b + 4*arcsin(c*x))
/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(2*a/b + 2*arcsin(c
*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

3.401 $\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=276

$$\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{64b^2c^2}+\frac{27\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{64b^2c^2}+\frac{25\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\sin}{b}\right.}{64b^2c^2}$$

```
[Out] -((x*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[
(a + b*ArcSin[c*x])/b])/(64*b^2*c^2) + (27*Cos[(3*a)/b]*CosIntegral[(3*(a +
 b*ArcSin[c*x]))/b])/(64*b^2*c^2) + (25*Cos[(5*a)/b]*CosIntegral[(5*(a + b*
ArcSin[c*x]))/b])/(64*b^2*c^2) + (7*Cos[(7*a)/b]*CosIntegral[(7*(a + b*ArcS
in[c*x]))/b])/(64*b^2*c^2) + (5*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b]
)/(64*b^2*c^2) + (27*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(
64*b^2*c^2) + (25*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(64*
b^2*c^2) + (7*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b^2*
c^2)
```

Rubi [A] time = 0.872172, antiderivative size = 272, normalized size of antiderivative = 0.99, number of steps used = 28, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4721, 4661, 3312, 3303, 3299, 3302, 4723, 4406}

$$\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64b^2c^2}+\frac{27\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{64b^2c^2}+\frac{25\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}\right.}{64b^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[
a/b + ArcSin[c*x]])/(64*b^2*c^2) + (27*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3
*ArcSin[c*x]])/(64*b^2*c^2) + (25*Cos[(5*a)/b]*CosIntegral[(5*a)/b + 5*ArcS
in[c*x]])/(64*b^2*c^2) + (7*Cos[(7*a)/b]*CosIntegral[(7*a)/b + 7*ArcSin[c*x
]])/(64*b^2*c^2) + (5*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(64*b^2*c^2)
 + (27*Sin[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(64*b^2*c^2) + (2
5*Sin[(5*a)/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(64*b^2*c^2) + (7*Sin[
(7*a)/b]*SinIntegral[(7*a)/b + 7*ArcSin[c*x]])/(64*b^2*c^2)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
```

```
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{x\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\int \frac{\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(7c)\int \frac{x^2\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Subst}\left(\int \frac{\cos^5(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{7\,\text{Subst}\left(\int \frac{\cos^5(x)\sin^2(x)}{a+bx}\,dx, x, \right.}{bc^2}$$

$$= -\frac{x\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Subst}\left(\int \left(\frac{5\cos(x)}{8(a+bx)} + \frac{5\cos(3x)}{16(a+bx)} + \frac{\cos(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^2} - 7\,\text{Subs}$$

$$= -\frac{x\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc^2} + \frac{7\,\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x, \sin^{-1}\right.}{64bc^2}$$

$$= -\frac{x\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(35\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64bc^2} + \left(5\cos\left(\frac{a}{b}\right)\right)\text{Sub}$$

$$= -\frac{x\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{5\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64b^2c^2} + \frac{27\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{64b^2c^2} +$$

Mathematica [A] time = 0.9453, size = 404, normalized size = 1.46

$$\frac{5\cos\left(\frac{a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+27\cos\left(\frac{3a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-64*b*c*x + 192*b*c^3*x^3 - 192*b*c^5*x^5 + 64*b*c^7*x^7 + 5*(a + b*ArcSin
[c*x])*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + 27*(a + b*ArcSin[c*x])*Cos
[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + 25*a*Cos[(5*a)/b]*CosIntegra
l[5*(a/b + ArcSin[c*x])] + 25*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b
 + ArcSin[c*x])] + 7*a*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 7*
b*ArcSin[c*x]*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 5*a*Sin[a/b
]*SinIntegral[a/b + ArcSin[c*x]] + 5*b*ArcSin[c*x]*Sin[a/b]*SinIntegral[a/b
 + ArcSin[c*x]] + 27*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 27
*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 25*a*Sin[(
5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + 25*b*ArcSin[c*x]*Sin[(5*a)/b]*
SinIntegral[5*(a/b + ArcSin[c*x])] + 7*a*Sin[(7*a)/b]*SinIntegral[7*(a/b +
ArcSin[c*x])] + 7*b*ArcSin[c*x]*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*
x])])/(64*b^2*c^2*(a + b*ArcSin[c*x]))
```

Maple [A] time = 0.057, size = 455, normalized size = 1.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/64/c^2*(27*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+27*arcsin(c*x
)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+5*arcsin(c*x)*Si(arcsin(c*x)+a/b)*si
n(a/b)*b+5*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+7*arcsin(c*x)*Si(7*ar
csin(c*x)+7*a/b)*sin(7*a/b)*b+7*arcsin(c*x)*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a
/b)*b+25*arcsin(c*x)*sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*b+25*arcsin(c*x)*Ci
(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b+27*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+
27*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+5*Si(arcsin(c*x)+a/b)*sin(a/b)*a+5*
Ci(arcsin(c*x)+a/b)*cos(a/b)*a+7*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*a+7*Ci(
7*arcsin(c*x)+7*a/b)*cos(7*a/b)*a+25*sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*a+2
5*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a-5*x*b*c-9*sin(3*arcsin(c*x))*b-sin(7
*arcsin(c*x))*b-5*sin(5*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^6x^7 - 3c^4x^5 + 3c^2x^3 - x - \frac{\left(7c^6\int \frac{x^6}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx - 15c^4\int \frac{x^4}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx + 9c^2\int \frac{x^2}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx - \int \frac{}{b\arc}\right.}{bc}}{b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^7 - 3*c^4*x^5 + 3*c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)*integrate((7*c^6*x^6 - 15*c^4*x^4 + 9*c^2*x^2 - 1)/(b^2*
c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x) - x)/(b^2*c*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\left(c^4x^5 - 2c^2x^3 + x\right)\sqrt{-c^2x^2 + 1}}{b^2\arcsin\left(cx\right)^2 + 2ab\arcsin\left(cx\right) + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^5 - 2*c^2*x^3 + x)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 +
2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.72422, size = 2735, normalized size = 9.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 7*b*arcsin(c*x)*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 7*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(7*
a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 7*a*cos(a/b)^7*cos
_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 7*a*co
s(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) - 49/4*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b + 7*arcsin(
c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/4*b*arcsin(c*x)*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 35/4*b
*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^2*arcsin(c*x) + a*b^2*c^2) + 25/4*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_in
tegral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/4*a*co
s(a/b)^5*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c
^2) + 25/4*a*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) - 35/4*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/4*a*cos(a/b)^4*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + (c^2*x
^2 - 1)^3*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 49/8*b*arcsin(c*x)*cos(
a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2
) - 125/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^
3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*b*arcsin(c*x)*cos(a/b)^3*cos_integra
l(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 21/8*b*arcsin(
c*x)*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsi
n(c*x) + a*b^2*c^2) - 75/16*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(
5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*b*arcsin(c
*x)*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) + 49/8*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/
(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 125/16*a*cos(a/b)^3*cos_integral(5*a/b
+ 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*a*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 21/8*a
*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 75/16*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin
(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*a*cos(a/b)^2*sin(a/b)*sin_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/64*b
*arcsin(c*x)*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c
*x) + a*b^2*c^2) + 125/64*b*arcsin(c*x)*cos(a/b)*cos_integral(5*a/b + 5*arc
sin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 81/64*b*arcsin(c*x)*cos(a/b)*
cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/6
4*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 7/64*b*arcsin(c*x)*sin(a/b)*sin_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/64*b*arcsin(c*x)*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/64*
b*arcsin(c*x)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 5/64*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c
*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/64*a*cos(a/b)*cos_integral(7*a/
b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 125/64*a*cos(a/b)*co
s_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 81/64
*a*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^
2*c^2) + 5/64*a*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 7/64*a*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*
c^2*arcsin(c*x) + a*b^2*c^2) + 25/64*a*sin(a/b)*sin_integral(5*a/b + 5*arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/64*a*sin(a/b)*sin_integral(
```

```
3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/64*a*sin(a/b)*
sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

3.402 $\int \frac{(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=217

$$\frac{15\sin\left(\frac{2a}{b}\right)\mathrm{CosIntegral}\left(\frac{2(a+b\sin^{-1}(cx))}{b}\right)}{16b^2c}+\frac{3\sin\left(\frac{4a}{b}\right)\mathrm{CosIntegral}\left(\frac{4(a+b\sin^{-1}(cx))}{b}\right)}{4b^2c}+\frac{3\sin\left(\frac{6a}{b}\right)\mathrm{CosIntegral}\left(\frac{6(a+b\sin^{-1}(cx))}{b}\right)}{16b^2c}$$

```
[Out] -((1 - c^2*x^2)^3/(b*c*(a + b*ArcSin[c*x]))) + (15*CosIntegral[(2*(a + b*Ar
cSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c) + (3*CosIntegral[(4*(a + b*ArcSin[c
*x]))/b]*Sin[(4*a)/b])/(4*b^2*c) + (3*CosIntegral[(6*(a + b*ArcSin[c*x]))/b
]*Sin[(6*a)/b])/(16*b^2*c) - (15*Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[
c*x]))/b])/(16*b^2*c) - (3*Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))
/b])/(4*b^2*c) - (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(1
6*b^2*c)
```

Rubi [A] time = 0.399717, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {4659, 4723, 4406, 3303, 3299, 3302}

$$\frac{15\sin\left(\frac{2a}{b}\right)\mathrm{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{16b^2c}+\frac{3\sin\left(\frac{4a}{b}\right)\mathrm{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{4b^2c}+\frac{3\sin\left(\frac{6a}{b}\right)\mathrm{CosIntegral}\left(\frac{6a}{b}+6\sin^{-1}(cx)\right)}{16b^2c}$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*(a + b*ArcSin[c*x]))) + (15*CosIntegral[(2*a)/b + 2*
ArcSin[c*x]]*Sin[(2*a)/b])/(16*b^2*c) + (3*CosIntegral[(4*a)/b + 4*ArcSin[c
*x]]*Sin[(4*a)/b])/(4*b^2*c) + (3*CosIntegral[(6*a)/b + 6*ArcSin[c*x]]*Sin[
(6*a)/b])/(16*b^2*c) - (15*Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]
])/(16*b^2*c) - (3*Cos[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(4*b^
2*c) - (3*Cos[(6*a)/b]*SinIntegral[(6*a)/b + 6*ArcSin[c*x]])/(16*b^2*c)
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{(6c)\int \frac{x\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{b}\\
&= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{6\,\text{Subst}\left(\int \frac{\cos^5(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{6\,\text{Subst}\left(\int \left(\frac{5\sin(2x)}{32(a+bx)}+\frac{\sin(4x)}{8(a+bx)}+\frac{\sin(6x)}{32(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{3\,\text{Subst}\left(\int \frac{\sin(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc} - \frac{3\,\text{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx, x, \sin^{-1}(cx\right.}{4bc}\\
&= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(15\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc} - \frac{\left(3\cos\left(\frac{4a}{b}\right)\right)\text{Sub}}{}\\
&= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{15\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{16b^2c} + \frac{3\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin\left(\frac{4a}{b}\right)}{4b^2c} +
\end{aligned}
$$

Mathematica [A] time = 0.82457, size = 311, normalized size = 1.43

$$
-\frac{-15\sin\left(\frac{2a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)-12\sin\left(\frac{4a}{b}\right)\left(a+b\sin^{-1}(cx)\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}\right.\right.}{}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(16*b - 48*b*c^2*x^2 + 48*b*c^4*x^4 - 16*b*c^6*x^6 - 15*(a + b*ArcSin[c*x]
)*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] - 12*(a + b*ArcSin[c*x])*
CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 3*a*CosIntegral[6*(a/b +
ArcSin[c*x])]*Sin[(6*a)/b] - 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcSin[c*
x])]*Sin[(6*a)/b] + 15*a*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] +
15*b*ArcSin[c*x]*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 12*a*Cos
[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] + 12*b*ArcSin[c*x]*Cos[(4*a)/b
]*SinIntegral[4*(a/b + ArcSin[c*x])] + 3*a*Cos[(6*a)/b]*SinIntegral[6*(a/b
+ ArcSin[c*x])] + 3*b*ArcSin[c*x]*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[
c*x])])/(16*b^2*c*(a + b*ArcSin[c*x]))
```

Maple [A] time = 0.054, size = 364, normalized size = 1.7

$$-\frac{1}{32\,c\,(a+b\arcsin(cx))\,b^2}\left(6\arcsin(cx)\operatorname{Si}\left(6\arcsin(cx)+6\,\frac{a}{b}\right)\cos\left(6\,\frac{a}{b}\right)b-6\arcsin(cx)\operatorname{Ci}\left(6\arcsin(cx)+6\,\frac{a}{b}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/32/c*(6*arcsin(c*x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-6*arcsin(c*x)*C
i(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*b+24*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)*b-24*arcsin(c*x)*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+30*arcsin(
c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-30*arcsin(c*x)*Ci(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*b+6*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*a-6*Ci(6*arcsin(c*x
)+6*a/b)*sin(6*a/b)*a+24*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-24*Ci(4*arcsi
n(c*x)+4*a/b)*sin(4*a/b)*a+30*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-30*Ci(2*
arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(6*arcsin(c*x))*b+6*cos(4*arcsin(c*x))*b
+15*cos(2*arcsin(c*x))*b+10*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^6x^6-3\,c^4x^4+3\,c^2x^2-6\left(b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int\frac{c^5x^5-2\,c^3x^3+cx}{b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+ab}\,dx-1}{b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)*integrate(6*(c^5*x^5 - 2*c^3*x^3 + c*x)/(b^2*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b), x) - 1)/(b^2*c*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\left(c^4x^4-2\,c^2x^2+1\right)\sqrt{-c^2x^2+1}}{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 +
2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.59521, size = 1882, normalized size = 8.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^
3*c*arcsin(c*x) + a*b^2*c) - 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*a/b
+ 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^5*cos_integra
l(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 6*a*cos(a
/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 6
*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3
*c*arcsin(c*x) + a*b^2*c) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b +
 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 9*b*arcsin(c*x)*co
s(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
- 6*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arc
sin(c*x) + a*b^2*c) - 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*si
n(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^3*cos_integral(4*a/b +
4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 9*a*cos(a/b)^4*sin_
integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 6*a*cos(a/b
)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 9/8
*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c
*arcsin(c*x) + a*b^2*c) - 3*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*a
rcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 15/8*b*arcsin(c*x)*cos
(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b
^2*c) - 27/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(
b^3*c*arcsin(c*x) + a*b^2*c) + 6*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/
b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 15/8*b*arcsin(c*x)*cos(a
/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + (
c^2*x^2 - 1)^3*b/(b^3*c*arcsin(c*x) + a*b^2*c) + 9/8*a*cos(a/b)*cos_integra
l(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 3*a*cos(a
/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2
*c) + 15/8*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*a
rcsin(c*x) + a*b^2*c) - 27/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x
))/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^2*sin_integral(4*a/b + 4*ar
csin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 15/8*a*cos(a/b)^2*sin_integral(2
*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 3/16*b*arcsin(c*x)*si
```

```
n_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 3/4*b*arc
sin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
+ 15/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c) + 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c) - 3/4*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x)
 + a*b^2*c) + 15/16*a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c)
```

3.403 $\int \frac{\left(1-c^2x^2\right)^{5/2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=234

$$-\frac{\text{Unintegrable}\left(\frac{\left(1-c^2x^2\right)^2}{x^2\left(a+b\sin^{-1}(cx)\right)},x\right)}{bc}-\frac{25\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8b^2}-\frac{25\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16b^2}$$

```
[Out] -((1 - c^2*x^2)^3/(b*c*x*(a + b*ArcSin[c*x]))) - (25*Cos[a/b]*CosIntegral[(
a + b*ArcSin[c*x])/b])/(8*b^2) - (25*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(16*b^2) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x]
))/b])/(16*b^2) - (25*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b^2)
- (25*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^2) - (5*Si
n[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2) - Unintegrable[
(1 - c^2*x^2)^2/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi [A] time = 0.53435, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*x*(a + b*ArcSin[c*x]))) - (25*Cos[a/b]*CosIntegral[a
/b + ArcSin[c*x]])/(8*b^2) - (25*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3*ArcSi
n[c*x]])/(16*b^2) - (5*Cos[(5*a)/b]*CosIntegral[(5*a)/b + 5*ArcSin[c*x]])/(
16*b^2) - (25*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(8*b^2) - (25*Sin[(3
*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b^2) - (5*Sin[(5*a)/b]*Sin
Integral[(5*a)/b + 5*ArcSin[c*x]])/(16*b^2) - Defer[Int][(1 - c^2*x^2)^2/(x
^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\sin^{-1}(cx))^2}\,dx = -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\sin^{-1}(cx))}\,dx}{bc} - \frac{(5c)\int \frac{(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{5\,\text{Subst}\left(\int \frac{\cos^5(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\sin^{-1}(cx))}\,dx}{bc}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{5\,\text{Subst}\left(\int \left(\frac{5\cos(x)}{8(a+bx)} + \frac{5\cos(3x)}{16(a+bx)} + \frac{\cos(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{b} - \int$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{5\,\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16b} - \frac{25\,\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x,\right.}{16b}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\sin^{-1}(cx))}\,dx}{bc} - \frac{\left(25\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}\right.}{8b}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{25\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2} - \frac{25\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx\right.}{16b^2}$$

Mathematica [A] time = 12.7212, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.424, size = 0, normalized size = 0.

$$\int \frac{1}{x(a+b\arcsin(cx))^2}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4-2\,c^2x^2+1\right)\sqrt{-c^2x^2+1}}{b^2x\arcsin\left(cx\right)^2+2\,abx\arcsin\left(cx\right)+a^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x*arcsin(c*x)^2
+ 2*a*b*x*arcsin(c*x) + a^2*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x), x)
```

3.404 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=104

$$-\frac{2\text{Unintegrable}\left(\frac{(1-c^2x^2)^2}{x^3(a+b\sin^{-1}(cx))},x\right)}{bc}-\frac{4c\text{Unintegrable}\left(\frac{(1-c^2x^2)^2}{x(a+b\sin^{-1}(cx))},x\right)}{b}-\frac{(1-c^2x^2)^3}{bcx^2\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -((1 - c^2*x^2)^3/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Unintegrable[(1 - c^2
*x^2)^2/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (4*c*Unintegrable[(1 - c^2*x
^2)^2/(x*(a + b*ArcSin[c*x])), x])/b
```

Rubi [A] time = 0.311626, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][(1 - c^2*x
^2)^2/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (4*c*Defer[Int][(1 - c^2*x^2)^
2/(x*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{(1-c^2x^2)^3}{bcx^2\left(a+b\sin^{-1}(cx)\right)}-\frac{2\int \frac{(1-c^2x^2)^2}{x^3(a+b\sin^{-1}(cx))}\,dx}{bc}-\frac{(4c)\int \frac{(1-c^2x^2)^2}{x(a+b\sin^{-1}(cx))}\,dx}{b}$$

Mathematica [A] time = 3.43973, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.443, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{c^6x^6 - 3\,c^4x^4 + 3\,c^2x^2 - 2\left(b^2cx^2 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^2\right)\int \frac{2\,c^6x^6 - 3\,c^4x^4 + 1}{b^2cx^3 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^3}\,dx - 1}{b^2cx^2 \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^2)*integrate(2*(2*c^6*x^6 - 3*c^4*x^4 + 1)/(b^2*c*x
^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3), x) - 1)/(b^2*c*
x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(c^4x^4 - 2\,c^2x^2 + 1\right)\sqrt{-c^2x^2 + 1}}{b^2x^2 \arcsin\left(cx\right)^2 + 2\,abx^2 \arcsin\left(cx\right) + a^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^2*arcsin(c*x)^
2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2 + 1\right)^{\frac{5}{2}}}{\left(b \arcsin\left(cx\right) + a\right)^2 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x^2), x)
```

3.405 $\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{(1-c^2x^2)^{5/2}}{x^3(a+b\sin^{-1}(cx))^2},x\right)$$

[Out] Unintegrable[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2), x]

Rubi [A] time = 0.139929, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2),x]

[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2), x]

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A] time = 15.979, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2), x]

Maple [A] time = 3.508, size = 0, normalized size = 0.

$$\int \frac{1}{x^3(a+b\arcsin(cx))^2}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{c^6x^6 - 3\,c^4x^4 + 3\,c^2x^2 - 3\left(b^2cx^3\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^3\right)\int \frac{c^6x^6 - c^4x^4 - c^2x^2 + 1}{b^2cx^4\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^4}\,dx - 1}{b^2cx^3\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^3)*integrate(3*(c^6*x^6 - c^4*x^4 - c^2*x^2 + 1)/(b
^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4), x) - 1)/(
b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4 - 2\,c^2x^2 + 1\right)\sqrt{-c^2x^2 + 1}}{b^2x^3\arcsin\left(cx\right)^2 + 2\,abx^3\arcsin\left(cx\right) + a^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^3*arcsin(c*x)^
2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2 + 1\right)^{\frac{5}{2}}}{\left(b\arcsin\left(cx\right) + a\right)^2 x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x^3), x)
```

3.406 $\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

[Out] Unintegrable[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2), x]

Rubi [A] time = 0.138433, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2),x]

[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2), x]

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 3.14644, size = 0, normalized size = 0.

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2), x]

Maple [A] time = 5.251, size = 0, normalized size = 0.

$$\int \frac{1}{x^4\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{c^6x^6 - 3\,c^4x^4 + 3\,c^2x^2 - 2\left(b^2cx^4\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^4\right)\int \frac{c^6x^6 - 3\,c^2x^2 + 2}{b^2cx^5\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^5}\,dx - 1}{b^2cx^4\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abcx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^4)*integrate(2*(c^6*x^6 - 3*c^2*x^2 + 2)/(b^2*c*x^5
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^5), x) - 1)/(b^2*c*x^
4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4x^4 - 2\,c^2x^2 + 1\right)\sqrt{-c^2x^2 + 1}}{b^2x^4\arcsin\left(cx\right)^2 + 2\,abx^4\arcsin\left(cx\right) + a^2x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^4*arcsin(c*x)^
2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**4/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2x^2 + 1\right)^{\frac{5}{2}}}{\left(b\arcsin\left(cx\right) + a\right)^2x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x^4), x)
```

3.407 $\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=48

$$\frac{m\text{Unintegrable}\left(\frac{x^{m-1}}{a+b\sin^{-1}(cx)},x\right)}{bc}-\frac{x^m}{bc\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(x^m/(b*c*(a + b*ArcSin[c*x]))) + (m*Unintegrable[x^(-1 + m)/(a + b*ArcSin
[c*x]), x])/(b*c)
```

Rubi [A] time = 0.1625, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^m/(b*c*(a + b*ArcSin[c*x]))) + (m*Defer[Int][x^(-1 + m)/(a + b*ArcSin[c
*x]), x])/(b*c)
```

Rubi steps

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{x^m}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{m\int \frac{x^{-1+m}}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

Mathematica [A] time = 0.596942, size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.233, size = 0, normalized size = 0.

$$\int \frac{x^m}{(a+b\arcsin(cx))^2}\frac{1}{\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{-x^m + \frac{\left(b^2cm\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+abcm\right)\int \frac{x^m}{\left(b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a\right)x}\,dx}{bc}}{b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] ((b^2*c*m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*m)*integrate(x
^m/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x), x) - x^m
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^m}{a^2c^2x^2+\left(b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\left(abc^2x^2-ab\right)\arcsin\left(cx\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{-c^2x^2+1}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^2), x)
```

3.408 $\int \frac{x^5}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=204

$$\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{8b^2c^6}-\frac{15\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16b^2c^6}+\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5\left(a+b\sin^{-1}\right.}{b}\right.}{16b^2c^6}$$

```
[Out] -(x^5/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*
x])/b])/(8*b^2*c^6) - (15*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c*x]))/
b])/(16*b^2*c^6) + (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x]))/b])/
(16*b^2*c^6) + (5*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b^2*c^6)
- (15*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^6) + (
5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^6)
```

Rubi [A] time = 0.440519, antiderivative size = 200, normalized size of antiderivative = 0.98, number of steps used = 13, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4719, 4635, 4406, 3303, 3299, 3302}

$$\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^6}-\frac{15\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{16b^2c^6}+\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5a}{b}\right.}{16b^2c^6}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^5/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x
]])/(8*b^2*c^6) - (15*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3*ArcSin[c*x]])/(1
6*b^2*c^6) + (5*Cos[(5*a)/b]*CosIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b^2*
c^6) + (5*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(8*b^2*c^6) - (15*Sin[(3
*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b^2*c^6) + (5*Sin[(5*a)/b]
*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b^2*c^6)
```

Rule 4719

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m*(a + b*ArcSin[c*x])^(n + 1))/(b
*c*Sqrt[d]*(n + 1)), x] - Dist[(f*m)/(b*c*Sqrt[d]*(n + 1)), Int[(f*x)^(m -
1)*(a + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &
& EqQ[c^2*d + e, 0] && LtQ[n, -1] && GtQ[d, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^5}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\int\frac{x^4}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\,\text{Subst}\left(\int\frac{\cos(x)\sin^4(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^6}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\,\text{Subst}\left(\int\left(\frac{\cos(x)}{8(a+bx)}-\frac{3\cos(3x)}{16(a+bx)}+\frac{\cos(5x)}{16(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{bc^6}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\,\text{Subst}\left(\int\frac{\cos(5x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{16bc^6}+\frac{5\,\text{Subst}\left(\int\frac{\cos(x)}{a+bx}\,dx,\right.}{8bc^6}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{8bc^6}-\frac{\left(15\cos\left(\right.\right.}{}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^6}-\frac{15\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}\right.}{16b^2c^6}$$

Mathematica [A] time = 0.344645, size = 157, normalized size = 0.77

$$\frac{5\left(2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\right.\right.}{16b^2c^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^5/(b*c*(a + b*ArcSin[c*x]))) + (5*(2*Cos[a/b]*CosIntegral[a/b + ArcSin[
c*x]] - 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Cos[(5*a)/b]*Co
sIntegral[5*(a/b + ArcSin[c*x])] + 2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]
] - 3*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + Sin[(5*a)/b]*SinInt
egral[5*(a/b + ArcSin[c*x])]))/(16*b^2*c^6)
```

Maple [A] time = 0.054, size = 341, normalized size = 1.7

$$\frac{1}{16 c^6 (a + b \arcsin(cx)) b^2}\left(5 \arcsin(cx) \operatorname{Ci}\left(5 \arcsin(cx) + 5\frac{a}{b}\right)\cos\left(5\frac{a}{b}\right)b - 15 \arcsin(cx) \operatorname{Si}\left(3 \arcsin(cx) + 3\frac{a}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] 1/16/c^6*(5*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-15*arcsin(c*x)
*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b-15*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b
)*cos(3*a/b)*b+10*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+10*arcsin(c*x)
*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+5*arcsin(c*x)*sin(5*a/b)*Si(5*arcsin(c*x)+5
*a/b)*b+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a-15*Si(3*arcsin(c*x)+3*a/b)*s
in(3*a/b)*a-15*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+10*Si(arcsin(c*x)+a/b)*
sin(a/b)*a+10*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+5*sin(5*a/b)*Si(5*arcsin(c*x)+
5*a/b)*a-10*x*b*c+5*sin(3*arcsin(c*x))*b-sin(5*arcsin(c*x))*b)/(a+b*arcsin(
c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^5 - \frac{5\left(b^2 c \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc\right)\int \frac{x^4}{b \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + a}\, dx}{bc}}{b^2 c \arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^5 - 5*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^4/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^5}{a^2c^2x^2 + \left(b^2c^2x^2 - b^2\right)\arcsin(cx)^2 - a^2 + 2\left(abc^2x^2 - ab\right)\arcsin(cx)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^5/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5}{\sqrt{-(cx-1)(cx+1)}(a + b \operatorname{asin}(cx))^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**5/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [B] time = 1.64913, size = 1725, normalized size = 8.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 5*b*arcsin(c*x)*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^6*arc
sin(c*x) + a*b^2*c^6) + 5*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(5*
a/b + 5*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 5*a*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 5*a*co
s(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^6*arcsin(c*x)
+ a*b^2*c^6) - 25/4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(
c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) - 15/4*b*arcsin(c*x)*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) - 15/4*b
*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c
^6*arcsin(c*x) + a*b^2*c^6) - 15/4*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_in
tegral(3*a/b + 3*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) - (c^2*x^2
- 1)^2*b*c*x/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) - 25/4*a*cos(a/b)^3*cos_inte
gral(5*a/b + 5*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) - 15/4*a*cos(
a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6
) - 15/4*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^6
*arcsin(c*x) + a*b^2*c^6) - 15/4*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b +
 3*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) - 2*(c^2*x^2 - 1)*b*c*x/(
b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 25/16*b*arcsin(c*x)*cos(a/b)*cos_integra
l(5*a/b + 5*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 45/16*b*arcsin
(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a
*b^2*c^6) + 5/8*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3
*c^6*arcsin(c*x) + a*b^2*c^6) + 5/16*b*arcsin(c*x)*sin(a/b)*sin_integral(5*
a/b + 5*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 15/16*b*arcsin(c*x
)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2
*c^6) + 5/8*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^6
*arcsin(c*x) + a*b^2*c^6) - b*c*x/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 25/16
*a*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^
2*c^6) + 45/16*a*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^6*arcs
in(c*x) + a*b^2*c^6) + 5/8*a*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*
c^6*arcsin(c*x) + a*b^2*c^6) + 5/16*a*sin(a/b)*sin_integral(5*a/b + 5*arcsi
n(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 15/16*a*sin(a/b)*sin_integral(3
*a/b + 3*arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6) + 5/8*a*sin(a/b)*si
n_integral(a/b + arcsin(c*x))/(b^3*c^6*arcsin(c*x) + a*b^2*c^6)
```

3.409 $\int \frac{x^4}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=141

$$-\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c^5}+\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{2b^2c^5}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c^5}-\frac{\cos\ldots}{}$$

```
[Out] -(x^4/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*(a + b*ArcSin[c*x]))/b]*
Sin[(2*a)/b])/(b^2*c^5) + (CosIntegral[(4*(a + b*ArcSin[c*x]))/b]*Sin[(4*a)
/b])/(2*b^2*c^5) + (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b
^2*c^5) - (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(2*b^2*c^5)
```

Rubi [A] time = 0.3586, antiderivative size = 141, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4719, 4635, 4406, 3303, 3299, 3302}

$$-\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c^5}+\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{2b^2c^5}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c^5}\ldots$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^4/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Si
n[(2*a)/b])/(b^2*c^5) + (CosIntegral[(4*a)/b + 4*ArcSin[c*x]]*Sin[(4*a)/b])
/(2*b^2*c^5) + (Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(b^2*c^5
) - (Cos[(4*a)/b]*SinIntegral[(4*a)/b + 4*ArcSin[c*x]])/(2*b^2*c^5)
```

Rule 4719

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m*(a + b*ArcSin[c*x])^(n + 1))/(b
*c*Sqrt[d]*(n + 1)), x] - Dist[(f*m)/(b*c*Sqrt[d]*(n + 1)), Int[(f*x)^(m -
1)*(a + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &
& EqQ[c^2*d + e, 0] && LtQ[n, -1] && GtQ[d, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^4}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^4}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{4\int \frac{x^3}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

$$= -\frac{x^4}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{4\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin^3(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^5}$$

$$= -\frac{x^4}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{4\,\mathrm{Subst}\left(\int \left(\frac{\sin(2x)}{4(a+bx)}-\frac{\sin(4x)}{8(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{bc^5}$$

$$= -\frac{x^4}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\mathrm{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2bc^5}+\frac{\mathrm{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx,x,\mathrm{s}\right.}{bc^5}$$

$$= -\frac{x^4}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{2a}{b}\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^5}-\frac{\cos\left(\frac{4a}{b}\right)\mathrm{Su}}{}$$

$$= -\frac{x^4}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\mathrm{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c^5}+\frac{\mathrm{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin\left(\right.}{2b^2c^5}$$

Mathematica [A] time = 0.300736, size = 117, normalized size = 0.83

$$\frac{-\frac{2bc^4x^4}{a+b\sin^{-1}(cx)}-2\sin\left(\frac{2a}{b}\right)\mathrm{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\sin\left(\frac{4a}{b}\right)\mathrm{CosIntegral}\left(4\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+2\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\right.}{2b^2c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] ((-2*b*c^4*x^4)/(a + b*ArcSin[c*x]) - 2*CosIntegral[2*(a/b + ArcSin[c*x])]*
Sin[(2*a)/b] + CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 2*Cos[(2*a
)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b +
 ArcSin[c*x])])/(2*b^2*c^5)
```

Maple [A] time = 0.05, size = 250, normalized size = 1.8

$$-\frac{1}{8\,b^2c^5\left(a+b\arcsin(cx)\right)}\left(4\arcsin(cx)\,\mathrm{Si}\left(4\arcsin(cx)+4\,\frac{a}{b}\right)\cos\left(4\,\frac{a}{b}\right)b-4\arcsin(cx)\,\mathrm{Ci}\left(4\arcsin(cx)+4\,\frac{a}{b}\right)\mathrm{sin}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] -1/8/c^5*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*
Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b-8*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*
cos(2*a/b)*b+8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+4*Si(4*arcs
in(c*x)+4*a/b)*cos(4*a/b)*a-4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a-8*Si(2*a
rcsin(c*x)+2*a/b)*cos(2*a/b)*a+8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(4
*arcsin(c*x))*b-4*cos(2*arcsin(c*x))*b+3*b)/b^2/(a+b*arcsin(c*x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^4 - \frac{4\left(b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int \frac{x^3}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx}{bc}}{b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^4 - 4*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^3/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^4}{a^2c^2x^2 + \left(b^2c^2x^2 - b^2\right)\arcsin\left(cx\right)^2 - a^2 + 2\left(abc^2x^2 - ab\right)\arcsin\left(cx\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^4/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**4/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [B] time = 1.56872, size = 1183, normalized size = 8.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^
3*c^5*arcsin(c*x) + a*b^2*c^5) - 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*
a/b + 4*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 4*a*cos(a/b)^3*cos
_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
 - 4*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*arcsin(c*x)
+ a*b^2*c^5) - 2*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))
*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*b*arcsin(c*x)*cos(a/b)*cos_
integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
+ 4*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*a
rcsin(c*x) + a*b^2*c^5) + 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2
*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*a*cos(a/b)*cos_integral
(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*a*co
s(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) +
a*b^2*c^5) + 4*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*ar
csin(c*x) + a*b^2*c^5) + 2*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))
/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - (c^2*x^2 - 1)^2*b/(b^3*c^5*arcsin(c*x)
 + a*b^2*c^5) - 1/2*b*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*
c^5*arcsin(c*x) + a*b^2*c^5) - b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(
c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*(c^2*x^2 - 1)*b/(b^3*c^5*arcsin
(c*x) + a*b^2*c^5) - 1/2*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*arc
sin(c*x) + a*b^2*c^5) - a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^5*arcs
in(c*x) + a*b^2*c^5) - b/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
```

3.410 $\int \frac{x^3}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=142

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b^2c^4}-\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{4b^2c^4}+\frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b^2c^4}-\frac{3\sin\left(\frac{3}{b}\right.}{}$$

```
[Out] -(x^3/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*
x])/b])/(4*b^2*c^4) - (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(4*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^4
) - (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^4)
```

Rubi [A] time = 0.340451, antiderivative size = 138, normalized size of antiderivative = 0.97, number of steps used = 10, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4719, 4635, 4406, 3303, 3299, 3302}

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^4}-\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4b^2c^4}+\frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^4}-$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^3/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x
]])/(4*b^2*c^4) - (3*Cos[(3*a)/b]*CosIntegral[(3*a)/b + 3*ArcSin[c*x]])/(4*
b^2*c^4) + (3*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b^2*c^4) - (3*Sin
[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(4*b^2*c^4)
```

Rule 4719

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m*(a + b*ArcSin[c*x])^(n + 1))/(b
*c*Sqrt[d]*(n + 1)), x] - Dist[(f*m)/(b*c*Sqrt[d]*(n + 1)), Int[(f*x)^(m -
1)*(a + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &
& EqQ[c^2*d + e, 0] && LtQ[n, -1] && GtQ[d, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^3}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\int\frac{x^2}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

$$= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\,\mathrm{Subst}\left(\int\frac{\cos(x)\sin^2(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^4}$$

$$= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\,\mathrm{Subst}\left(\int\left(\frac{\cos(x)}{4(a+bx)}-\frac{\cos(3x)}{4(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{bc^4}$$

$$= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\,\mathrm{Subst}\left(\int\frac{\cos(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4bc^4}-\frac{3\,\mathrm{Subst}\left(\int\frac{\cos(3x)}{a+bx}\,dx,\right.}{4bc^4}$$

$$= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\left(3\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int\frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4bc^4}-\frac{\left(3\cos\left(\frac{3a}{b}\right.\right.}{}$$

$$= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^4}-\frac{3\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(\frac{3a}{b}+3\sin^{-1}(\right.}{4b^2c^4}$$

Mathematica [A] time = 0.268754, size = 113, normalized size = 0.8

$$\frac{3\left(\cos\left(\frac{a}{b}\right)\mathrm{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-\cos\left(\frac{3a}{b}\right)\mathrm{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-\sin\left(\frac{3}{}\right.\right.}{4b^2c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^3/(b*c*(a + b*ArcSin[c*x]))) + (3*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*
x]] - Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Sin[a/b]*SinIntegra
l[a/b + ArcSin[c*x]] - Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]))/(4
*b^2*c^4)
```

Maple [A] time = 0.046, size = 227, normalized size = 1.6

$$-\frac{1}{4c^4(a+b\arcsin(cx))b^2}\left(3\arcsin(cx)\,\mathrm{Si}\left(3\arcsin(cx)+3\frac{a}{b}\right)\sin\left(3\frac{a}{b}\right)b+3\arcsin(cx)\,\mathrm{Ci}\left(3\arcsin(cx)+3\frac{a}{b}\right)\mathrm{co}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] -1/4/c^4*(3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+3*arcsin(c*x)*
Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b-3*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(
a/b)*b-3*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+3*Si(3*arcsin(c*x)+3*a/
b)*sin(3*a/b)*a+3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a-3*Si(arcsin(c*x)+a/b
)*sin(a/b)*a-3*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+3*x*b*c-sin(3*arcsin(c*x))*b)
/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^3 - \frac{3\left(b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int \frac{x^2}{b\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx}{bc}}{b^2c\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^3 - 3*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^2/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}\,x^3}{a^2c^2x^2+\left(b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\left(abc^2x^2-ab\right)\arcsin\left(cx\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [B] time = 1.55248, size = 859, normalized size = 6.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -3*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 3*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(3
*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 3*a*cos(a/b)^3*co
s_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 3*a*c
os(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) - (c^2*x^2 - 1)*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 9/4
*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin
(c*x) + a*b^2*c^4) + 3/4*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c
*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/4*b*arcsin(c*x)*sin(a/b)*sin_int
egral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/4*b*arcs
in(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b
^2*c^4) - b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 9/4*a*cos(a/b)*cos_inte
gral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/4*a*cos(a
/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/4
*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^
2*c^4) + 3/4*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x
) + a*b^2*c^4)
```

3.411 $\int \frac{x^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=79

$$-\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{b^2c^3}-\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(x^2/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*(a + b*ArcSin[c*x]))/b]*
Sin[(2*a)/b])/(b^2*c^3) + (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))
/b])/(b^2*c^3)
```

Rubi [A] time = 0.244308, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4719, 4635, 4406, 12, 3303, 3299, 3302}

$$-\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b^2c^3}-\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^2/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Si
n[(2*a)/b])/(b^2*c^3) + (Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])
/(b^2*c^3)
```

Rule 4719

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m*(a + b*ArcSin[c*x])^(n + 1))/(b
*c*Sqrt[d]*(n + 1)), x] - Dist[(f*m)/(b*c*Sqrt[d]*(n + 1)), Int[(f*x)^(m -
1)*(a + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &
& EqQ[c^2*d + e, 0] && LtQ[n, -1] && GtQ[d, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{x^2}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{2\int \frac{x}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

$$= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{2\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^3}$$

$$= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{2\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{2(a+bx)}\,dx, x, \sin^{-1}(cx)\right)}{bc^3}$$

$$= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\mathrm{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^3}$$

$$= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\cos\left(\frac{2a}{b}\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \frac{\sin\left(\frac{2a}{b}\right)\mathrm{Su}}{}$$

$$= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\mathrm{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c^3} + \frac{\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(\frac{2a}{b}+2\sin^{-1}(c\right.}{b^2c^3}$$

Mathematica [A] time = 0.156889, size = 70, normalized size = 0.89

$$\frac{-\frac{bc^2x^2}{a+b\sin^{-1}(cx)} - \sin\left(\frac{2a}{b}\right)\mathrm{CosIntegral}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right) + \cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)}{b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] (-((b*c^2*x^2)/(a + b*ArcSin[c*x])) - CosIntegral[2*(a/b + ArcSin[c*x])]*Si
n[(2*a)/b] + Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b^2*c^3)
```

Maple [A] time = 0.047, size = 136, normalized size = 1.7

$$\frac{1}{2b^2c^3(a+b\arcsin(cx))}\left(2\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx)+2\frac{a}{b}\right)\cos\left(2\frac{a}{b}\right)b - 2\arcsin(cx)\,\mathrm{Ci}\left(2\arcsin(cx)+2\frac{a}{b}\right)\sin\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] 1/2/c^3*(2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-2*arcsin(c*x)*C
i(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-
2*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(2*arcsin(c*x))*b-b)/b^2/(a+b*arc
sin(c*x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^2-\frac{2\left(b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int\frac{x}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx}{bc}}{b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^2 - 2*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*
c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^2}{a^2c^2x^2+\left(b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\left(abc^2x^2-ab\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [B] time = 1.48108, size = 467, normalized size = 5.91

$$-\frac{2b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin\left(cx\right)+ab^2c^3}+\frac{2b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{b^3c^3\arcsin\left(cx\right)+ab^2c^3}-\frac{2a\cos\left(\frac{a}{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3
*c^3*arcsin(c*x) + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a
/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)*cos_in
tegral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) +
2*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a
*b^2*c^3) - b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcs
in(c*x) + a*b^2*c^3) - (c^2*x^2 - 1)*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) -
a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - b
/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

3.412 $\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=72

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}-\frac{x}{bc\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(x/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/
b])/(b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c^2)
```

Rubi [A] time = 0.149846, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4719, 4623, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}-\frac{x}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/
b])/(b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c^2)
```

Rule 4719

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m*(a + b*ArcSin[c*x])^(n + 1))/(b
*c*Sqrt[d]*(n + 1)), x] - Dist[(f*m)/(b*c*Sqrt[d]*(n + 1)), Int[(f*x)^(m -
1)*(a + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &
& EqQ[c^2*d + e, 0] && LtQ[n, -1] && GtQ[d, 0]
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rubi steps

$$\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\int \frac{1}{a+b\sin^{-1}(cx)}\,dx}{bc}$$
$$= -\frac{x}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{b^2c^2}$$
$$= -\frac{x}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Su}}{}$$
$$= -\frac{x}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}$$

Mathematica [A] time = 0.106928, size = 59, normalized size = 0.82

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-\frac{bcx}{a+b\sin^{-1}(cx)}}{b^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] (-((b*c*x)/(a + b*ArcSin[c*x])) + Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] +
 Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c^2)
```

Maple [A] time = 0.042, size = 108, normalized size = 1.5

$$\frac{1}{c^2\left(a+b\arcsin(cx)\right)b^2}\left(\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\arcsin(cx)\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\text{Si}\left(\text{arc}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] 1/c^2*(arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+arcsin(c*x)*Ci(arcsin(c*x
)+a/b)*cos(a/b)*b+Si(arcsin(c*x)+a/b)*sin(a/b)*a+Ci(arcsin(c*x)+a/b)*cos(a/
b)*a-x*b*c)/(a+b*arcsin(c*x))/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{-x+\frac{\left(b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc\right)\int \frac{1}{b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a}\,dx}{bc}}{b^2c\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] ((b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(1/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x) - x)/(b^2*c*arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x}{a^2c^2x^2+\left(b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\left(abc^2x^2-ab\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*
x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [B] time = 1.47322, size = 270, normalized size = 3.75

$$\frac{b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2}+\frac{b\arcsin\left(cx\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2}-\frac{bcx}{b^3c^2\arcsin\left(cx\right)+ab^2c^2}+\frac{a\,c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x)
 + a*b^2*c^2) + b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3
*c^2*arcsin(c*x) + a*b^2*c^2) - b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + a
*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
 + a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*
c^2)
```

3.413 $\int \frac{1}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=18

$$-\frac{1}{bc\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(1/(b*c*(a + b*ArcSin[c*x])))
```

Rubi [A] time = 0.0437099, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.04, Rules used = {4641}

$$-\frac{1}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*(a + b*ArcSin[c*x])))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Mathematica [A] time = 0.007966, size = 18, normalized size = 1.

$$-\frac{1}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*(a + b*ArcSin[c*x])))
```

Maple [A] time = 0.006, size = 19, normalized size = 1.1

$$-\frac{1}{bc\left(a+b\arcsin(cx)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] -1/b/c/(a+b*arcsin(c*x))
```

Maxima [A] time = 1.49348, size = 24, normalized size = 1.33

$$-\frac{1}{(b \arcsin(cx) + a)bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/((b*arcsin(c*x) + a)*b*c)
```

Fricas [A] time = 2.26342, size = 43, normalized size = 2.39

$$-\frac{1}{b^2 c \arcsin(cx) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/(b^2*c*arcsin(c*x) + a*b*c)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.1342, size = 24, normalized size = 1.33

$$-\frac{1}{(b \arcsin(cx) + a)bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/((b*arcsin(c*x) + a)*b*c)
```

3.414 $\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=46

$$-\frac{\text{Unintegrable}\left(\frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)},x\right)}{bc}-\frac{1}{bcx\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(1/(b*c*x*(a + b*ArcSin[c*x]))) - Unintegrable[1/(x^2*(a + b*ArcSin[c*x]))
, x]/(b*c)
```

Rubi [A] time = 0.152327, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*x*(a + b*ArcSin[c*x]))) - Defer[Int][1/(x^2*(a + b*ArcSin[c*x])),
x]/(b*c)
```

Rubi steps

$$\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A] time = 7.2923, size = 0, normalized size = 0.

$$\int \frac{1}{x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.13, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)^2}\frac{1}{\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\frac{\left(b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx\right)\int\frac{1}{\left(b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a\right)x^2}\,dx}{bc}+1}{b^2cx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -((b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)*integrate(
1/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) +
1)/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{a^2c^2x^3-a^2x+\left(b^2c^2x^3-b^2x\right)\arcsin\left(cx\right)^2+2\left(abc^2x^3-abx\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^2*x^3 - a^2*x + (b^2*c^2*x^3 - b^2*x)*a
rcsin(c*x)^2 + 2*(a*b*c^2*x^3 - a*b*x)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{x\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{-c^2x^2+1}\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^2*x), x)
```

3.415 $\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=46

$$-\frac{2\text{Unintegrable}\left(\frac{1}{x^3\left(a+b\sin^{-1}(cx)\right)},x\right)}{bc}-\frac{1}{bcx^2\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(1/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Unintegrable[1/(x^3*(a + b*ArcSin[c
*x])), x])/(b*c)
```

Rubi [A] time = 0.1493, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][1/(x^3*(a + b*ArcSin[c*x
])), x])/(b*c)
```

Rubi steps

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bcx^2\left(a+b\sin^{-1}(cx)\right)}-\frac{2\int \frac{1}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A] time = 1.28753, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.093, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)^2}\frac{1}{\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\frac{2\left(b^2cx^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^2\right)\int\frac{1}{\left(b\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+a\right)x^3}\,dx}{bc}+1}{b^2cx^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+abcx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima
")
```

```
[Out] -(2*(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)*inte
grate(1/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3),
 x) + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{a^2c^2x^4-a^2x^2+\left(b^2c^2x^4-b^2x^2\right)\arcsin\left(cx\right)^2+2\left(abc^2x^4-abx^2\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^2*x^4 - a^2*x^2 + (b^2*c^2*x^4 - b^2*x^
2)*arcsin(c*x)^2 + 2*(a*b*c^2*x^4 - a*b*x^2)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{x^2\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x**2*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{-c^2x^2+1}\left(b\arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^2*x^2), x)
```

3.416 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^m}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.136483, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^m}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 1.11673, size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.448, size = 0, normalized size = 0.

$$\int \frac{x^m}{(a+b\arcsin(cx))^2}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^m}{a^2c^4x^4-2\,a^2c^2x^2+\left(b^2c^4x^4-2\,b^2c^2x^2+b^2\right)\arcsin\left(cx\right)^2+a^2+2\left(abc^4x^4-2\,abc^2x^2+ab\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^m}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

3.417 $\int \frac{x^3}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^3}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.140723, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^3}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]

[Out] Defer[Int][x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^3}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^3}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 59.0095, size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.482, size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^3}{a^2c^4x^4-2\,a^2c^2x^2+\left(b^2c^4x^4-2\,b^2c^2x^2+b^2\right)\arcsin\left(cx\right)^2+a^2+2\left(abc^4x^4-2\,abc^2x^2+ab\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^3}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^3}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(x^3/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

3.418 $\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=68

$$\frac{2\text{Unintegrable}\left(\frac{x}{\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)},x\right)}{bc}-\frac{x^2}{bc\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(x^2/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*Unintegrable[x/((1 - c^
2*x^2)^2*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi [A] time = 0.201254, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^2/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*Defer[Int][x/((1 - c^2*
x^2)^2*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{x^2}{bc\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}+\frac{2\int \frac{x}{\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A] time = 7.81968, size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.327, size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x^2}{a^2c^4x^4-2a^2c^2x^2+\left(b^2c^4x^4-2b^2c^2x^2+b^2\right)\arcsin\left(cx\right)^2+a^2+2\left(abc^4x^4-2abc^2x^2+ab\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

3.419 $\int \frac{x}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=28

$$\text{Unintegrable}\left(\frac{x}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.0929563, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 58.2373, size = 0, normalized size = 0.

$$\int \frac{x}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.223, size = 0, normalized size = 0.

$$\int \frac{x}{\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}x}{a^2c^4x^4-2a^2c^2x^2+\left(b^2c^4x^4-2b^2c^2x^2+b^2\right)\arcsin\left(cx\right)^2+a^2+2\left(abc^4x^4-2abc^2x^2+ab\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4 -
 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^2
+ a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{x}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(x/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

3.420 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=63

$$\frac{2c\text{Unintegrable}\left(\frac{x}{(1-c^2x^2)^2(a+b\sin^{-1}(cx))},x\right)}{b}-\frac{1}{bc\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(1/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*c*Unintegrable[x/((1 - c^
2*x^2)^2*(a + b*ArcSin[c*x])), x])/b
```

Rubi [A] time = 0.107705, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*c*Defer[Int][x/((1 - c^2*
x^2)^2*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\int \frac{1}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bc\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}+\frac{(2c)\int \frac{x}{(1-c^2x^2)^2(a+b\sin^{-1}(cx))}\,dx}{b}$$

Mathematica [A] time = 2.56931, size = 0, normalized size = 0.

$$\int \frac{1}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.194, size = 0, normalized size = 0.

$$\int \frac{1}{(a+b\arcsin(cx))^2}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}}{a^2c^4x^4-2a^2c^2x^2+\left(b^2c^4x^4-2b^2c^2x^2+b^2\right)\arcsin(cx)^2+a^2+2\left(abc^4x^4-2abc^2x^2+ab\right)\arcsin(cx)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4 - 2
*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 +
a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}(cx)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin(cx)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

3.421 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.131511, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 46.9071, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 2.224, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}}{a^2c^4x^5-2a^2c^2x^3+a^2x+\left(b^2c^4x^5-2b^2c^2x^3+b^2x\right)\arcsin\left(cx\right)^2+2\left(abc^4x^5-2abc^2x^3+abx\right)\arcsin\left(cx\right)},\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^5 - 2*a^2*c^2*x^3 + a^2*x + (b^2*c^4
*x^5 - 2*b^2*c^2*x^3 + b^2*x)*arcsin(c*x)^2 + 2*(a*b*c^4*x^5 - 2*a*b*c^2*x^
3 + a*b*x)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2*x), x)
```

3.422 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))^2} dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.132117, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2} dx = \int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2} dx$$

Mathematica [A] time = 31.4241, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.642, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{2\left(abc^3x^4 - abcx^2 + \left(b^2c^3x^4 - b^2cx^2\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)\right)\int \frac{2c^2x^2-1}{abc^5x^7-2abc^3x^5+abcx^3+\left(b^2c^5x^7-2b^2c^3x^5+b^2cx^3\right)\arctan(c}}{abc^3x^4 - abcx^2 + \left(b^2c^3x^4 - b^2cx^2\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] ((a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^3*x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)))*integrate(2*(2*c^2*x^2 - 1)/(a*b*c^5*x^7 - 2*a*b*c^3
*x^5 + a*b*c*x^3 + (b^2*c^5*x^7 - 2*b^2*c^3*x^5 + b^2*c*x^3)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^3*
x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2x^2+1}}{a^2c^4x^6 - 2a^2c^2x^4 + a^2x^2 + \left(b^2c^4x^6 - 2b^2c^2x^4 + b^2x^2\right)\arcsin(cx)^2 + 2\left(abc^4x^6 - 2abc^2x^4 + abx^2\right)\arcsin(c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^6 - 2*a^2*c^2*x^4 + a^2*x^2 + (b^2*c
^4*x^6 - 2*b^2*c^2*x^4 + b^2*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*x^6 - 2*a*b*c^
2*x^4 + a*b*x^2)*arcsin(c*x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2*x^2), x)
```

3.423 $\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.133107, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 1.63056, size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.564, size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^m}{a^2c^6x^6-3\,a^2c^4x^4+3\,a^2c^2x^2+\left(b^2c^6x^6-3\,b^2c^4x^4+3\,b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\left(abc^6x^6-3\,abc^4x^4+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

3.424 $\int \frac{x^3}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^3}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.134232, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^3}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^3}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^3}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 100.053, size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 3.177, size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^3}{a^2c^6x^6-3\,a^2c^4x^4+3\,a^2c^2x^2+\left(b^2c^6x^6-3\,b^2c^4x^4+3\,b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\left(abc^6x^6-3\,abc^4x^4+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.425 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2},x\right)$$

```
[Out] Unintegrable[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.136184, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx=\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A] time = 11.3901, size = 0, normalized size = 0.

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 2.841, size = 0, normalized size = 0.

$$\int \frac{x^2}{(a+b\arcsin(cx))^2}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{x^2 + 2\left(abc^5x^4 - 2\,abc^3x^2 + abc + \left(b^2c^5x^4 - 2\,b^2c^3x^2 + b^2c\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)\right)\int \frac{}{abc^7x^6 - 3\,abc^5x^4 + 3\,abc^3x^2 - abc + (}}{abc^5x^4 - 2\,abc^3x^2 + abc + \left(b^2c^5x^4 - 2\,b^2c^3x^2 + b^2c\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-c}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(x^2 + (a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2
 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(2*(c^2*x^3
+ x)/(a*b*c^7*x^6 - 3*a*b*c^5*x^4 + 3*a*b*c^3*x^2 - a*b*c + (b^2*c^7*x^6 -
3*b^2*c^5*x^4 + 3*b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1))), x))/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^
3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x^2}{a^2c^6x^6 - 3\,a^2c^4x^4 + 3\,a^2c^2x^2 + \left(b^2c^6x^6 - 3\,b^2c^4x^4 + 3\,b^2c^2x^2 - b^2\right)\arcsin\left(cx\right)^2 - a^2 + 2\left(abc^6x^6 - 3\,abc^4x^4 + \right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\text{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

3.426 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=28

$$\text{Unintegrable}\left(\frac{x}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.0935245, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{x}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 103.175, size = 0, normalized size = 0.

$$\int \frac{x}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 2.423, size = 0, normalized size = 0.

$$\int \frac{x}{(a+b\arcsin(cx))^2}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}x}{a^2c^6x^6-3\,a^2c^4x^4+3\,a^2c^2x^2+\left(b^2c^6x^6-3\,b^2c^4x^4+3\,b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\left(abc^6x^6-3\,abc^4x^4\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x^2
 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2
+ 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\text{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.427 $\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=63

$$\frac{4c\text{Unintegrable}\left(\frac{x}{\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)},x\right)}{b}-\frac{1}{bc\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(1/(b*c*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))) + (4*c*Unintegrable[x/((1 -
c^2*x^2)^3*(a + b*ArcSin[c*x])), x])/b
```

Rubi [A] time = 0.109742, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))) + (4*c*Defer[Int][x/((1 - c^
2*x^2)^3*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bc\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}+\frac{(4c)\int \frac{x}{\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}\,dx}{b}$$

Mathematica [A] time = 4.01419, size = 0, normalized size = 0.

$$\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.462, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{a^2c^6x^6 - 3\,a^2c^4x^4 + 3\,a^2c^2x^2 + \left(b^2c^6x^6 - 3\,b^2c^4x^4 + 3\,b^2c^2x^2 - b^2\right)\arcsin\left(cx\right)^2 - a^2 + 2\left(abc^6x^6 - 3\,abc^4x^4\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x^2 +
 (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 +
2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

3.428 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.131477, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 77.6403, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 6.138, size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{a^2c^6x^7 - 3\,a^2c^4x^5 + 3\,a^2c^2x^3 - a^2x + \left(b^2c^6x^7 - 3\,b^2c^4x^5 + 3\,b^2c^2x^3 - b^2x\right)\arcsin\left(cx\right)^2 + 2\left(abc^6x^7 - 3\,abc^4\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^7 - 3*a^2*c^4*x^5 + 3*a^2*c^2*x^3 -
 a^2*x + (b^2*c^6*x^7 - 3*b^2*c^4*x^5 + 3*b^2*c^2*x^3 - b^2*x)*arcsin(c*x)^
2 + 2*(a*b*c^6*x^7 - 3*a*b*c^4*x^5 + 3*a*b*c^2*x^3 - a*b*x)*arcsin(c*x)), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.429 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=30

$$\text{Unintegrable}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.131632, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 23.6725, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 6.249, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\arcsin(cx)\right)^2}\left(-c^2x^2+1\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{2\left(abc^5x^6-2\,abc^3x^4+abcx^2+\left(b^2c^5x^6-2\,b^2c^3x^4+b^2cx^2\right)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right)\int\frac{}{abc^7x^9-3\,abc^5x^7+3\,abc^3x^5-ab}}{abc^5x^6-2\,abc^3x^4+abcx^2+\left(b^2c^5x^6-2\,b^2c^3x^4+b^2cx^2\right)\arctan\left(cx,\sqrt{cx}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -((a*b*c^5*x^6 - 2*a*b*c^3*x^4 + a*b*c*x^2 + (b^2*c^5*x^6 - 2*b^2*c^3*x^4 +
 b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(2*(3*c^2*
x^2 - 1)/(a*b*c^7*x^9 - 3*a*b*c^5*x^7 + 3*a*b*c^3*x^5 - a*b*c*x^3 + (b^2*c^
7*x^9 - 3*b^2*c^5*x^7 + 3*b^2*c^3*x^5 - b^2*c*x^3)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^5*x^6 - 2*a*b*c^3*x^4 + a*b*c*x^2 + (b^
2*c^5*x^6 - 2*b^2*c^3*x^4 + b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)))
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-c^2x^2+1}}{a^2c^6x^8-3\,a^2c^4x^6+3\,a^2c^2x^4-a^2x^2+\left(b^2c^6x^8-3\,b^2c^4x^6+3\,b^2c^2x^4-b^2x^2\right)\arcsin\left(cx\right)^2+2\left(abc^6x^8-3\,ab\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^8 - 3*a^2*c^4*x^6 + 3*a^2*c^2*x^4 -
 a^2*x^2 + (b^2*c^6*x^8 - 3*b^2*c^4*x^6 + 3*b^2*c^2*x^4 - b^2*x^2)*arcsin(c
*x)^2 + 2*(a*b*c^6*x^8 - 3*a*b*c^4*x^6 + 3*a*b*c^2*x^4 - a*b*x^2)*arcsin(c*
x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.430 $\int \frac{1}{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}\,dx$

Optimal. Leaf size=13

$$-\frac{1}{2a\sin^{-1}(ax)^2}$$

```
[Out] -1/(2*a*ArcSin[a*x]^2)
```

Rubi [A] time = 0.0309994, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4641}

$$-\frac{1}{2a\sin^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3),x]
```

```
[Out] -1/(2*a*ArcSin[a*x]^2)
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}\,dx=-\frac{1}{2a\sin^{-1}(ax)^2}$$

Mathematica [A] time = 0.0052446, size = 13, normalized size = 1.

$$-\frac{1}{2a\sin^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3),x]
```

```
[Out] -1/(2*a*ArcSin[a*x]^2)
```

Maple [A] time = 0.01, size = 12, normalized size = 0.9

$$-\frac{1}{2\,a\,(\arcsin(ax))^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] -1/2/a/arcsin(a*x)^2
```

Maxima [A] time = 1.43998, size = 15, normalized size = 1.15

$$-\frac{1}{2\,a\arcsin\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/2/(a*arcsin(a*x)^2)
```

Fricas [A] time = 2.0407, size = 32, normalized size = 2.46

$$-\frac{1}{2\,a\arcsin\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/2/(a*arcsin(a*x)^2)
```

Sympy [A] time = 1.15787, size = 12, normalized size = 0.92

$$-\frac{1}{2a\operatorname{asin}^2\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] -1/(2*a*asin(a*x)**2)
```

Giac [A] time = 1.43421, size = 15, normalized size = 1.15

$$-\frac{1}{2\,a\arcsin\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2/(a*arcsin(a*x)^2)
```

3.431 $\int \frac{x^3\left(d-c^2dx^2\right)}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=251

$$-\frac{\sqrt{3\pi}d\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3\sqrt{\pi}d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3\sqrt{\pi}d\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{8b^{3/2}c^4}$$

```
[Out] (-2*d*x^3*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (d*Sqrt[3*Pi
]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8
*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*
x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*FresnelS[(2*Sqrt[
a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(8*b^(3/2)*c^4) - (d*
Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*
a)/b])/(8*b^(3/2)*c^4)
```

Rubi [A] time = 1.44441, antiderivative size = 251, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4721, 4723, 4406, 3306, 3305, 3351, 3304, 3352}

$$-\frac{\sqrt{3\pi}d\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3\sqrt{\pi}d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3\sqrt{\pi}d\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{8b^{3/2}c^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```


```
[Out] (-2*d*x^3*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (d*Sqrt[3*Pi
]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8
*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*
x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*FresnelS[(2*Sqrt[
a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(8*b^(3/2)*c^4) - (d*
Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*
a)/b])/(8*b^(3/2)*c^4)
```


Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
```

```
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{x^3\left(d-c^2dx^2\right)}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2dx^3\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(6d)\int \frac{x^2\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(12cd)\int \frac{x^4\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2dx^3\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(6d)\,\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{(12d)\,\text{Subst}\left(\int \frac{\cos}{}\right.}{}$$

$$= -\frac{2dx^3\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(6d)\,\text{Subst}\left(\int \left(\frac{1}{8\sqrt{a+bx}} - \frac{\cos(4x)}{8\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{(12d)\,\text{Subst}}{}$$

$$= -\frac{2dx^3\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(3d)\,\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc^4} - \frac{(3d)\,\text{Subst}\left(\int \frac{\cos(6x)}{\sqrt{a+bx}}\,dx,\right.}{8bc^4}$$

$$= -\frac{2dx^3\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(3d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc^4} - \frac{\left(3d\cos\left(\frac{6a}{b}\right.\right.}{}$$

$$= -\frac{2dx^3\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(3d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{4b^2c^4} - \frac{(3d}{}$$

$$= -\frac{2dx^3\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{d\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)C\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} + \frac{3d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)C\left(\frac{2\sqrt{a+b\sin}}{\sqrt{b}\sqrt{}}\right.}{8b^{3/2}c^4}$$

Mathematica [C] time = 1.4099, size = 287, normalized size = 1.14

$$-\frac{ide^{-\frac{6ia}{b}}\left(3\sqrt{2}e^{\frac{4ia}{b}}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-3\sqrt{2}e^{\frac{8ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] ((-I/32)*d*(3*Sqrt[2]*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Ga
mma[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[2]*E^(((8*I)*a)/b)*Sqrt[(
I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[
6]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6*I)*(a + b*ArcSin[c*x]
))/b] + Sqrt[6]*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
 ((6*I)*(a + b*ArcSin[c*x]))/b] - (6*I)*E^(((6*I)*a)/b)*Sin[2*ArcSin[c*x]]
+ (2*I)*E^(((6*I)*a)/b)*Sin[6*ArcSin[c*x]]))/(b*c^4*E^(((6*I)*a)/b)*Sqrt[a
+ b*ArcSin[c*x]])
```

Maple [A] time = 0.097, size = 287, normalized size = 1.1

$$-\frac{d}{16\,bc^4}\left(2\sqrt{3}\sqrt{a+b\arcsin(cx)}\cos\left(6\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\sqrt{6}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{b^{-1}}b}\right)\sqrt{\pi}\sqrt{b^{-1}}+2\sqrt{3}\sqrt{a+b\arcsin(cx)}\,\text{s}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] -1/16/c^4*d/b*(2*3^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(6*a/b)*FresnelC(2^(1/2
)/Pi^(1/2)*6^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1
/2)+2*3^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(6*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*
6^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)-6*(1/b)
^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(2*a/b)*FresnelC(2/Pi^(1/2)/(1/b
)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-6*(1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))
^(1/2)*sin(2*a/b)*FresnelS(2/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b
)+3*sin(2*(a+b*arcsin(c*x))/b-2*a/b)-sin(6*(a+b*arcsin(c*x))/b-6*a/b))/(a+b
*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int \frac{\left(c^2dx^2-d\right)x^3}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int -\frac{x^3}{a\sqrt{a+b\operatorname{asin}\left(cx\right)}+b\sqrt{a+b\operatorname{asin}\left(cx\right)}\operatorname{asin}\left(cx\right)}\,dx+\int \frac{c^2x^5}{a\sqrt{a+b\operatorname{asin}\left(cx\right)}+b\sqrt{a+b\operatorname{asin}\left(cx\right)}\operatorname{asin}\left(cx\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(
c*x)), x) + Integral(c**2*x**5/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin
(c*x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2-d\right)x^3}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

3.432 $\int \frac{x^2\left(d-c^2dx^2\right)}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=591

$$-\frac{\sqrt{2\pi}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}+\frac{5\sqrt{\frac{\pi}{2}}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3}-\frac{\sqrt{\frac{2\pi}{3}}d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\sqrt{\cdots}\right.}{b^{3/2}c^3}$$

```
[Out] (-2*d*x^2*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (5*d*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt
[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (d*Sqrt[(2*Pi)/
3]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^
(3/2)*c^3) + (d*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (5*d*Sqrt[Pi/2]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*b^(3/2)*c^3) - (d*Sqrt
[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^
(3/2)*c^3) + (5*d*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/
Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c^3) - (d*Sqrt[(2*Pi)/3]*FresnelC[(Sqrt[6
/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c^3) - (d*Sqr
t[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*
a)/b])/(4*b^(3/2)*c^3)
```

Rubi [A] time = 1.66822, antiderivative size = 591, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4721, 4723, 4406, 3306, 3305, 3351, 3304, 3352}

$$-\frac{\sqrt{2\pi}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}+\frac{5\sqrt{\frac{\pi}{2}}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3}-\frac{\sqrt{\frac{2\pi}{3}}d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\sqrt{\cdots}\right.}{b^{3/2}c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*x^2*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (5*d*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt
[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (d*Sqrt[(2*Pi)/
3]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^
(3/2)*c^3) + (d*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (5*d*Sqrt[Pi/2]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*b^(3/2)*c^3) - (d*Sqrt
[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^
(3/2)*c^3) + (5*d*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/
Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c^3) - (d*Sqrt[(2*Pi)/3]*FresnelC[(Sqrt[6
/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c^3) - (d*Sqr
t[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*
a)/b])/(4*b^(3/2)*c^3)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{x^2\left(d-c^2dx^2\right)}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2dx^2\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{(4d)\int\frac{x\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc}-\frac{(10cd)\int\frac{x^3\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$=-\frac{2dx^2\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{(4d)\,\text{Subst}\left(\int\frac{\cos^2(x)\sin(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{(10d)\,\text{Subst}\left(\int\frac{\cos^2(x)\,\text{s}}{\sqrt{a+}}\right.}{bc}$$

$$=-\frac{2dx^2\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{(4d)\,\text{Subst}\left(\int\left(\frac{\sin(x)}{4\sqrt{a+bx}}+\frac{\sin(3x)}{4\sqrt{a+bx}}\right)dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{(10d)\,\text{Subst}\left(\int\right.}{}$$

$$=-\frac{2dx^2\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{(5d)\,\text{Subst}\left(\int\frac{\sin(3x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{8bc^3}+\frac{(5d)\,\text{Subst}\left(\int\frac{\sin(5x)}{\sqrt{a+bx}}\,dx,x,\text{s}\right.}{8bc^3}$$

$$=-\frac{2dx^2\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{\left(5d\cos\left(\frac{a}{b}\right)\right)\text{Subst}}{}$$

$$=-\frac{2dx^2\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\sin^{-1}(cx)}\right)}{b^2c^3}-\frac{\left(5d\cos\left(\frac{a}{b}\right.\right.}{}$$

$$=-\frac{2dx^2\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{5d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3}+\frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(c}}{\sqrt{b}}\right.}{b^{3/2}c^3}$$

Mathematica [C] time = 1.54075, size = 514, normalized size = 0.87

$$\frac{de^{-\frac{5i\left(a+b\sin^{-1}(cx)\right)}{b}}\left(2e^{\frac{4ia}{b}+5i\sin^{-1}(cx)}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+2e^{\frac{6ia}{b}+5i\sin^{-1}(cx)}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d*(E^(((5*I)*a)/b) + E^(((5*I)*a)/b + (2*I)*ArcSin[c*x]) - 2*E^(((5*I)*a)/
b + (4*I)*ArcSin[c*x]) - 2*E^(((5*I)*a)/b + (6*I)*ArcSin[c*x]) + E^(((5*I)*
a)/b + (8*I)*ArcSin[c*x]) + E^(((5*I)*(a + 2*b*ArcSin[c*x]))/b) + 2*E^(((4*
I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
((-I)*(a + b*ArcSin[c*x]))/b] + 2*E^(((6*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[
(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*
E^(((2*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*E^(((8*I)*a)/b + (5*I)*Arc
Sin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c
*x]))/b] - Sqrt[5]*E^((5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]
*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[5]*E^(((5*I)*(2*a + b*Ar
cSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((5*I)*(a + b*Arc
Sin[c*x]))/b]))/(16*b*c^3*E^(((5*I)*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcS
in[c*x]])
```

Maple [A] time = 0.106, size = 441, normalized size = 0.8

$$\frac{d}{8\,b c^{3}}\left(\sqrt{3}\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin\left(cx\right)}\cos\left(3\,\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\sqrt{3}}{\sqrt{\pi}b}\sqrt{a+b\arcsin\left(cx\right)}\frac{1}{\sqrt{b^{-1}}}\right)-\sqrt{3}\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a+b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] 1/8/c^3*d/b*(3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*c
os(3*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(
1/2)/b)-3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*
a/b)*FresnelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b)-(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*5^(1/2)*FresnelC(2^
(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*sin(5*a/b)+(1
/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*5^(1/2)*cos(5*a/b)*Fresn
elS(2^(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-2*(1/b)
^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/P
i^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+2*(1/b)^(1/2)*Pi^(1/2)*2^(1/
2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b)-2*cos((a+b*arcsin(c*x))/b-a/b)+cos(3*(a+b*arcsin(
c*x))/b-3*a/b)+cos(5*(a+b*arcsin(c*x))/b-5*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{\left(c^{2}dx^{2}-d\right)x^{2}}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int-\frac{x^{2}}{a\sqrt{a+b\,\mathrm{asin}\left(cx\right)}+b\sqrt{a+b\,\mathrm{asin}\left(cx\right)}\,\mathrm{asin}\left(cx\right)}\,dx+\int\frac{c^{2}x^{4}}{a\sqrt{a+b\,\mathrm{asin}\left(cx\right)}+b\sqrt{a+b\,\mathrm{asin}\left(cx\right)}\,\mathrm{asin}\left(cx\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(
c*x)), x) + Integral(c**2*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin
(c*x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2-d\right)x^2}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

3.433 $\int \frac{x(d-c^2dx^2)}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=241

$$\frac{\sqrt{\frac{\pi}{2}}d\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{\pi}d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{\pi}d\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}c^2}$$

```
[Out] (-2*d*x*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d*Sqrt[Pi/2]*
Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(
3/2)*c^2) + (d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(
Sqrt[b]*Sqrt[Pi])])/(b^(3/2)*c^2) + (d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(b^(3/2)*c^2) + (d*Sqrt[Pi/2]*F
resnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3
/2)*c^2)
```

Rubi [A] time = 0.786533, antiderivative size = 241, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4721, 4661, 3312, 3306, 3305, 3351, 3304, 3352, 4723, 4406}

$$\frac{\sqrt{\frac{\pi}{2}}d\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{\pi}d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{\pi}d\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```


```
[Out] (-2*d*x*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d*Sqrt[Pi/2]*
Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(
3/2)*c^2) + (d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(
Sqrt[b]*Sqrt[Pi])])/(b^(3/2)*c^2) + (d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(b^(3/2)*c^2) + (d*Sqrt[Pi/2]*F
resnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3
/2)*c^2)
```


Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
```

```
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{x\left(d-c^2dx^2\right)}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2dx\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d)\int \frac{\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(8cd)\int \frac{x^2\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2dx\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d)\,\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{(8d)\,\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(}{\sqrt{a+bx}}\right.}{bc^2}$$

$$= -\frac{2dx\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d)\,\text{Subst}\left(\int \left(\frac{1}{2\sqrt{a+bx}}+\frac{\cos(2x)}{2\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{bc^2} - (8d)\,\text{Subst}\,($$

$$= -\frac{2dx\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d\,\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} + \frac{d\,\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{a+bx}}\,dx, x, \sin\right.}{bc^2}$$

$$= -\frac{2dx\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} + \left(d\cos\left(\frac{4a}{b}\right)\right)$$

$$= -\frac{2dx\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(2d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{b^2c^2} + (2d$$

$$= -\frac{2dx\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)C\left(\frac{2\sqrt{a+b\sin^{-1}}}{\sqrt{b}\sqrt{\pi}}\right.}{b^{3/2}c^2}$$

Mathematica [C] time = 2.22426, size = 375, normalized size = 1.56

$$d\left(\frac{ie^{-\frac{4ia}{b}}\left(\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\right.\right.}{b\sqrt{a+b\sin^{-1}(cx)}}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d*(8*(b^(-1))^(3/2)*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[b^(-1)]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[Pi]] + 8*(b^(-1))^(3/2)*Sqrt[Pi]*FresnelS[(2*Sqrt[b^
(-1)]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[Pi]]*Sin[(2*a)/b] + (I*(Sqrt[2]*E^(((2*
I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-2*I)*(a + b*ArcSi
n[c*x]))/b] - Sqrt[2]*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma
[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*G
amma[1/2, ((-4*I)*(a + b*ArcSin[c*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*
ArcSin[c*x]))/b]*Gamma[1/2, ((4*I)*(a + b*ArcSin[c*x]))/b] + (2*I)*E^(((4*I
)*a)/b)*Sin[2*ArcSin[c*x]] + I*E^(((4*I)*a)/b)*Sin[4*ArcSin[c*x]]))/(b*E^((
(4*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])))/(4*c^2)
```

Maple [A] time = 0.079, size = 283, normalized size = 1.2

$$\frac{d}{4\,bc^{2}}\left(2\sqrt{2}\sqrt{a+b\arcsin\left(cx\right)}\cos\left(4\,\frac{a}{b}\right)\mathrm{FresnelC}\left(2\,\frac{\sqrt{2}\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\sqrt{b^{-1}}b}\right)\sqrt{\pi}\sqrt{b^{-1}}+2\sqrt{2}\sqrt{a+b\arcsin\left(cx\right)}\sin\left(4\,\frac{a}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] 1/4/c^2*d/b*(2*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(4*a/b)*FresnelC(2*2^(1/2
)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)+2*2^
(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(1/b)^
(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)+4*(1/b)^(1/2)*Pi^(1/2
)*(a+b*arcsin(c*x))^(1/2)*cos(2*a/b)*FresnelC(2/Pi^(1/2)/(1/b)^(1/2)*(a+b*a
rcsin(c*x))^(1/2)/b)+4*(1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(2*a
/b)*FresnelS(2/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-sin(4*(a+b*a
rcsin(c*x))/b-4*a/b)-2*sin(2*(a+b*arcsin(c*x))/b-2*a/b))/(a+b*arcsin(c*x))^
(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{\left(c^{2}dx^{2}-d\right)x}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int-\frac{x}{a\sqrt{a+b\,\mathrm{asin}\left(cx\right)}+b\sqrt{a+b\,\mathrm{asin}\left(cx\right)}\,\mathrm{asin}\left(cx\right)}\,dx+\int\frac{c^{2}x^{3}}{a\sqrt{a+b\,\mathrm{asin}\left(cx\right)}+b\sqrt{a+b\,\mathrm{asin}\left(cx\right)}\,\mathrm{asin}\left(cx\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(c*x
)), x) + Integral(c**2*x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
```

```
x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(c^2dx^2-d\right)x}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*x/(b*arcsin(c*x) + a)^(3/2), x)
```

3.434 $\int \frac{d-c^2dx^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=253

$$\frac{3\sqrt{\frac{\pi}{2}}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}+\frac{\sqrt{\frac{3\pi}{2}}d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{3\sqrt{\frac{\pi}{2}}d\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}}}{\sqrt{b}}\right.}{b^{3/2}c}$$

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (3*d*Sqrt[Pi/2]*
Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c
) - (d*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c) + (3*d*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) + (d*Sqrt[(3*Pi)/2]*Fresnel
C[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c)
```

Rubi [A] time = 0.591869, antiderivative size = 253, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4659, 4723, 4406, 3306, 3305, 3351, 3304, 3352}

$$\frac{3\sqrt{\frac{\pi}{2}}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}+\frac{\sqrt{\frac{3\pi}{2}}d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{3\sqrt{\frac{\pi}{2}}d\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}}}{\sqrt{b}}\right.}{b^{3/2}c}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (3*d*Sqrt[Pi/2]*
Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c
) - (d*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c) + (3*d*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) + (d*Sqrt[(3*Pi)/2]*Fresnel
C[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c)
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{d-c^2dx^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(6cd)\int \frac{x\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(6d)\,\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(6d)\,\text{Subst}\left(\int \left(\frac{\sin(x)}{4\sqrt{a+bx}} + \frac{\sin(3x)}{4\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(3d)\,\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2bc} - \frac{(3d)\,\text{Subst}\left(\int \frac{\sin(3x)}{\sqrt{a+bx}}\,dx, x, \text{s}\right.}{2bc}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2bc} - \frac{\left(3d\cos\left(\frac{3a}{b}\right)\right)\text{Sub}}{}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{b^2c} - \frac{\left(3d\cos\left(\right.\right.}{}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{3d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{d\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(}}{\sqrt{b}}\right.}{b^{3/2}c}$$

Mathematica [C] time = 1.0961, size = 348, normalized size = 1.38

$$\frac{de^{-\frac{3i\left(a+b\sin^{-1}(cx)\right)}{b}}\left(3e^{\frac{2ia}{b}+3i\sin^{-1}(cx)}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2}, -\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right) + 3e^{\frac{4ia}{b}+3i\sin^{-1}(cx)}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d - c^2*d*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d*(-E^(((3*I)*a)/b) - 3*E^(((3*I)*a)/b + (2*I)*ArcSin[c*x]) - 3*E^(((3*I)*
a)/b + (4*I)*ArcSin[c*x]) - E^(((3*I)*(a + 2*b*ArcSin[c*x]))/b) + 3*E^(((2*
I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
((-I)*(a + b*ArcSin[c*x]))/b] + 3*E^(((4*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[
(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] + Sqrt[3]*
E^((3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)
*(a + b*ArcSin[c*x]))/b] + Sqrt[3]*E^((3*I)*((2*a)/b + ArcSin[c*x]))*Sqrt[(
I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b]))/(4*b*
c*E^(((3*I)*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.074, size = 297, normalized size = 1.2

$$-\frac{d}{2\,bc}\left(\sqrt{3}\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin(cx)}\cos\left(3\,\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{3}}{\sqrt{\pi}b}\sqrt{a+b\arcsin(cx)}\frac{1}{\sqrt{b^{-1}}}\right) - \sqrt{3}\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\,\text{a}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] -1/2/c*d/b*(3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*co
s(3*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1
/2)/b)-3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*a
/b)*FresnelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b
)+3*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(
2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-3*(1/b)^(1/2)*Pi^(1
/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b
)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+3*cos((a+b*arcsin(c*x))/b-a/b)+cos(3*(a+
b*arcsin(c*x))/b-3*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int \frac{c^2dx^2 - d}{(b\arcsin(cx) + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-d\left(\int \frac{c^2x^2}{a\sqrt{a+b\,\mathrm{asin}\,(cx)} + b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx + \int -\frac{1}{a\sqrt{a+b\,\mathrm{asin}\,(cx)} + b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(c**2*x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*a
sin(c*x)), x) + Integral(-1/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{c^2dx^2 - d}{(b\arcsin(cx) + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)/(b*arcsin(c*x) + a)^(3/2), x)
```

3.435 $\int \frac{d-c^2dx^2}{x\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=170

$$-\frac{2d\text{Unintegrable}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}},x\right)}{bc}-\frac{2\sqrt{\pi}d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{b^{3/2}}-\frac{2\sqrt{\pi}d\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}}$$

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (2*d*Sqrt[Pi]*
Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/b^(3
/2) - (2*d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])
]*Sin[(2*a)/b])/b^(3/2) - (2*d*Unintegrable[1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a
 + b*ArcSin[c*x]]), x])/(b*c)
```

Rubi [A] time = 0.778696, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{d-c^2dx^2}{x\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (2*d*Sqrt[Pi]*
Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/b^(3
/2) - (2*d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])
]*Sin[(2*a)/b])/b^(3/2) - (2*d*Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a +
 b*ArcSin[c*x]]), x])/(b*c)
```

Rubi steps

$$\int \frac{d-c^2dx^2}{x\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d)\int \frac{\sqrt{1-c^2x^2}}{x^2\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(4cd)\int \frac{\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(4d)\,\mathrm{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{(2d)\int\left(-\frac{c^2}{\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}}}\right.}{}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(4d)\,\mathrm{Subst}\left(\int\left(\frac{1}{2\sqrt{a+bx}}+\frac{\cos(2x)}{2\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{b} - \frac{(2d)\int \frac{}{x^2\sqrt{1-}}}{}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d)\,\mathrm{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(}}}{bc}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{\left(2d\cos\left(\frac{2a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2\right.}{\sqrt{a+bx}}\right.}{b}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{\left(4d\cos\left(\frac{2a}{b}\right)\right)\mathrm{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right.\right.}{b^2}$$

$$= -\frac{2d\left(1-c^2x^2\right)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{2d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)C\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}} - \frac{2d\sqrt{\pi}S\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2}{}\right.}{b^{3/2}}$$

Mathematica [A] time = 1.8356, size = 0, normalized size = 0.

$$\int \frac{d-c^2dx^2}{x\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Integrate[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A] time = 0.3, size = 0, normalized size = 0.

$$\int \frac{-c^2dx^2+d}{x}\left(a+b\arcsin(cx)\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{c^2dx^2 - d}{(b\arcsin(cx) + a)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-d\left(\int \frac{c^2x^2}{ax\sqrt{a+b\operatorname{asin}(cx)} + bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx + \int -\frac{1}{ax\sqrt{a+b\operatorname{asin}(cx)} + bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)/x/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(c**2*x**2/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b*asin(c*x
))*asin(c*x)), x) + Integral(-1/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b
*asin(c*x))*asin(c*x)), x))
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{c^2dx^2 - d}{(b\arcsin(cx) + a)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

3.436 $\int \frac{x^3(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx$

Optimal. Leaf size=485

$$\frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}-\frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4}+\frac{3\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{Fresnel}}{16b^{3/2}c^4}$$

```
[Out] (-2*d^2*x^3*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[
Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqr
t[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*Cos[(2*a
)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(16*b^(3/2)*
c^4) - (d^2*Sqrt[Pi]*Cos[(8*a)/b]*FresnelC[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqr
t[b]*Sqrt[Pi])])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*
ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(16*b^(3/2)*c^4) + (d^2*Sqr
t[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/
b])/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*Arc
Sin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(16*b^(3/2)*c^4) - (d^2*Sqrt[Pi]*FresnelS
[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(8*a)/b])/(16*b^(3/2)*
c^4)
```

Rubi [A] time = 1.66205, antiderivative size = 485, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4721, 4723, 4406, 3306, 3305, 3351, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}-\frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4}+\frac{3\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{Fresnel}}{16b^{3/2}c^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*x^3*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[
Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqr
t[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*Cos[(2*a
)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(16*b^(3/2)*
c^4) - (d^2*Sqrt[Pi]*Cos[(8*a)/b]*FresnelC[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqr
t[b]*Sqrt[Pi])])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*
ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(16*b^(3/2)*c^4) + (d^2*Sqr
t[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/
b])/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*Arc
Sin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(16*b^(3/2)*c^4) - (d^2*Sqrt[Pi]*FresnelS
[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(8*a)/b])/(16*b^(3/2)*
c^4)
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
```

```
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{x^3\left(d-c^2dx^2\right)^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2d^2x^3\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(6d^2\right)\int \frac{x^2\left(1-c^2x^2\right)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{\left(16cd^2\right)\int \frac{x^4\left(1-c^2x^2\right)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d^2x^3\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(6d^2\right)\text{Subst}\left(\int \frac{\cos^4(x)\sin^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{\left(16d^2\right)\text{Subst}\left(\int \frac{\cos^4}{}\right.}{}$$

$$= -\frac{2d^2x^3\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(6d^2\right)\text{Subst}\left(\int \left(\frac{1}{16\sqrt{a+bx}} + \frac{\cos(2x)}{32\sqrt{a+bx}} - \frac{\cos(4x)}{16\sqrt{a+bx}} - \frac{\cos(6x)}{32\sqrt{a+bx}}\right) dx, x, \sin^{-1}\right.}{bc^4}$$

$$= -\frac{2d^2x^3\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\,\text{Subst}\left(\int \frac{\cos(8x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc^4} + \frac{\left(3d^2\right)\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx, x, \text{s}\right.}{16bc^4}$$

$$= -\frac{2d^2x^3\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{16bc^4} - \frac{\left(3d^2\cos\left(\frac{4a}{b}\right)\right.}{}$$

$$= -\frac{2d^2x^3\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{8b^2c^4} - \frac{\left(3d^2\text{c}\right.}{}$$

$$= -\frac{2d^2x^3\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} - \frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)C\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\text{s}}}{\sqrt{b}}\right.}{16b^{3/2}c^4}$$

Mathematica [C] time = 2.74498, size = 540, normalized size = 1.11

$$-\frac{id^2e^{-\frac{8ia}{b}}\left(3\sqrt{2}e^{\frac{6ia}{b}}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-3\sqrt{2}e^{\frac{10ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] ((-I/64)*d^2*(3*Sqrt[2]*E^(((6*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*
Gamma[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[2]*E^(((10*I)*a)/b)*Sqr
t[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] + 2*
E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-4*I)*(a +
b*ArcSin[c*x]))/b] - 2*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gam
ma[1/2, ((4*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[6]*E^(((2*I)*a)/b)*Sqrt[((-I)
*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[
6]*E^(((14*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((6*I)*(a +
b*ArcSin[c*x]))/b] - Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
((-8*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[2]*E^(((16*I)*a)/b)*Sqrt[(I*(a + b*A
rcSin[c*x]))/b]*Gamma[1/2, ((8*I)*(a + b*ArcSin[c*x]))/b] - (6*I)*E^(((8*I)
*a)/b)*Sin[2*ArcSin[c*x]] - (2*I)*E^(((8*I)*a)/b)*Sin[4*ArcSin[c*x]] + (2*I
)*E^(((8*I)*a)/b)*Sin[6*ArcSin[c*x]] + I*E^(((8*I)*a)/b)*Sin[8*ArcSin[c*x]]
))/(b*c^4*E^(((8*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.105, size = 551, normalized size = 1.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] -1/64/c^4*d^2/b*(4*3^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(6*a/b)*FresnelC(2^(1
/2)/Pi^(1/2)*6^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^
(1/2)+4*3^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(6*a/b)*FresnelS(2^(1/2)/Pi^(1/2
)*6^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)-4*2^(
1/2)*(a+b*arcsin(c*x))^(1/2)*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(1/b)^(
1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)-4*2^(1/2)*(a+b*arcsin(
c*x))^(1/2)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(
c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)+4*(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*P
i^(1/2)*cos(8*a/b)*FresnelC(4/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b)+4*(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)*sin(8*a/b)*FresnelS(4/Pi^
(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-12*(1/b)^(1/2)*Pi^(1/2)*(a+b*a
rcsin(c*x))^(1/2)*cos(2*a/b)*FresnelC(2/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*
x))^(1/2)/b)-12*(1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(2*a/b)*Fre
snelS(2/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-2*sin(6*(a+b*arcsin
(c*x))/b-6*a/b)-sin(8*(a+b*arcsin(c*x))/b-8*a/b)+6*sin(2*(a+b*arcsin(c*x))/
b-2*a/b)+2*sin(4*(a+b*arcsin(c*x))/b-4*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2 d x^2 - d\right)^2 x^3}{\left(b \arcsin\left(cx\right) + a\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima
")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas
")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2 \left(\int \frac{x^3}{a\sqrt{a + b \operatorname{asin}\left(cx\right)} + b\sqrt{a + b \operatorname{asin}\left(cx\right)} \operatorname{asin}\left(cx\right)}\, dx + \int -\frac{2c^2 x^5}{a\sqrt{a + b \operatorname{asin}\left(cx\right)} + b\sqrt{a + b \operatorname{asin}\left(cx\right)} \operatorname{asin}\left(cx\right)}\, dx + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin
(c*x)), x) + Integral(-2*c**2*x**5/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*
asin(c*x))*asin(c*x)), x) + Integral(c**4*x**7/(a*sqrt(a + b*asin(c*x)) + b
*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2-d\right)^2x^3}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

3.437 $\int \frac{x^2(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx$

Optimal. Leaf size=511

$$\frac{5\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{\sqrt{\frac{3\pi}{2}}d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{3\sqrt{\frac{5\pi}{2}}d^2\sin\left(\frac{5a}{b}\right)\text{Fresne}}{16b^{3/}}$$

```
[Out] (-2*d^2*x^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqr
t[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(1
6*b^(3/2)*c^3) + (d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (3*d^2*Sqrt[(5*Pi)/2]*Cos
[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3
/2)*c^3) + (d^2*Sqrt[(7*Pi)/2]*Cos[(7*a)/b]*FresnelS[(Sqrt[14/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (5*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(16*b^(3/2)*c^3) - (d^
2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin
[(3*a)/b])/(16*b^(3/2)*c^3) - (3*d^2*Sqrt[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*S
qrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(16*b^(3/2)*c^3) - (d^2*Sqrt
[(7*Pi)/2]*FresnelC[(Sqrt[14/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(7*a
)/b])/(16*b^(3/2)*c^3)
```

Rubi [A] time = 2.12356, antiderivative size = 511, normalized size of antiderivative = 1., number of steps used = 42, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4721, 4723, 4406, 3306, 3305, 3351, 3304, 3352}

$$\frac{5\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{\sqrt{\frac{3\pi}{2}}d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{3\sqrt{\frac{5\pi}{2}}d^2\sin\left(\frac{5a}{b}\right)\text{Fresne}}{16b^{3/}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```


```
[Out] (-2*d^2*x^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqr
t[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(1
6*b^(3/2)*c^3) + (d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (3*d^2*Sqrt[(5*Pi)/2]*Cos
[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3
/2)*c^3) + (d^2*Sqrt[(7*Pi)/2]*Cos[(7*a)/b]*FresnelS[(Sqrt[14/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (5*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(16*b^(3/2)*c^3) - (d^
2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin
[(3*a)/b])/(16*b^(3/2)*c^3) - (3*d^2*Sqrt[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*S
qrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(16*b^(3/2)*c^3) - (d^2*Sqrt
[(7*Pi)/2]*FresnelC[(Sqrt[14/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(7*a
)/b])/(16*b^(3/2)*c^3)
```


Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
```

```
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{x^2 \left(d-c^2dx^2\right)^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(4d^2\right)\int \frac{x\left(1-c^2x^2\right)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{\left(14cd^2\right)\int \frac{x^3\left(1-c^2x^2\right)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(4d^2\right)\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \frac{\left(14d^2\right)\text{Subst}\left(\int \frac{c}{}\right.}{}$$

$$= -\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(4d^2\right)\text{Subst}\left(\int \left(\frac{\sin(x)}{8\sqrt{a+bx}} + \frac{3\sin(3x)}{16\sqrt{a+bx}} + \frac{\sin(5x)}{16\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{bc^3} -$$

$$= -\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(7d^2\right)\text{Subst}\left(\int \frac{\sin(5x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{32bc^3} + \frac{\left(7d^2\right)\text{Subst}\left(\int \frac{\sin(7x)}{\sqrt{a+bx}}\,d\right.}{32bc^3}$$

$$= -\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2bc^3} - \frac{\left(21d^2\cos\left(\frac{a}{b}\right)\right)}{}$$

$$= -\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{b^2c^3} - \frac{\left(21d^2\right.}{}$$

$$= -\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{d^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b}}{\sqrt{}}\right.}{16b^{3/2}c^3}$$

Mathematica [C] time = 2.75583, size = 686, normalized size = 1.34

$$\frac{d^2e^{-\frac{7i\left(a+b\sin^{-1}(cx)\right)}{b}}\left(5e^{\frac{6ia}{b}+7i\sin^{-1}(cx)}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2}, -\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right) + 5e^{\frac{8ia}{b}+7i\sin^{-1}(cx)}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamm}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d^2*(E^(((7*I)*a)/b) + 3*E^(((7*I)*a)/b + (2*I)*ArcSin[c*x]) + E^(((7*I)*a
)/b + (4*I)*ArcSin[c*x]) - 5*E^(((7*I)*a)/b + (6*I)*ArcSin[c*x]) - 5*E^(((7
*I)*a)/b + (8*I)*ArcSin[c*x]) + E^(((7*I)*a)/b + (10*I)*ArcSin[c*x]) + 3*E^
(((7*I)*a)/b + (12*I)*ArcSin[c*x]) + E^(((7*I)*(a + 2*b*ArcSin[c*x]))/b) +
5*E^(((6*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Ga
mma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 5*E^(((8*I)*a)/b + (7*I)*ArcSin[c*
x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] -
 Sqrt[3]*E^(((4*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x])
)/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*E^(((10*I)*a)/b +
 (7*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a +
b*ArcSin[c*x]))/b] - 3*Sqrt[5]*E^(((2*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - 3*S
qrt[5]*E^(((12*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]
*Gamma[1/2, ((5*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[7]*E^((7*I)*ArcSin[c*x])*
Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-7*I)*(a + b*ArcSin[c*x]))/
b] - Sqrt[7]*E^(((7*I)*(2*a + b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]
```

```
))/b]*Gamma[1/2, ((7*I)*(a + b*ArcSin[c*x]))/b]))/(64*b*c^3*E^(((7*I)*(a +
b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.112, size = 590, normalized size = 1.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] 1/32/c^3*d^2/b*(3*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*5^(1
/2)*cos(5*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*
x))^(1/2)/b)-3*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*5^(1/2)
*FresnelC(2^(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*s
in(5*a/b)-3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(
3*a/b)*FresnelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)+3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(3*a/b
)*FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+
(a+b*arcsin(c*x))^(1/2)*2^(1/2)*cos(7*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*7^(1/2
)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(1/b)^(1/2)*Pi^(1/2)*7^(1/2)-(a+b*
arcsin(c*x))^(1/2)*2^(1/2)*sin(7*a/b)*FresnelC(2^(1/2)/Pi^(1/2)*7^(1/2)/(1/
b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(1/b)^(1/2)*Pi^(1/2)*7^(1/2)-5*(1/b)^(1
/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(
1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+5*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*
(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b
*arcsin(c*x))^(1/2)/b)+3*cos(5*(a+b*arcsin(c*x))/b-5*a/b)+cos(7*(a+b*arcsin
(c*x))/b-7*a/b)-5*cos((a+b*arcsin(c*x))/b-a/b)+cos(3*(a+b*arcsin(c*x))/b-3*
a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2 - d\right)^2 x^2}{\left(b \arcsin\left(cx\right) + a\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima
")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas
")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int \frac{x^2}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\int -\frac{2c^2x^4}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin
(c*x)), x) + Integral(-2*c**2*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*
asin(c*x))*asin(c*x)), x) + Integral(c**4*x**6/(a*sqrt(a + b*asin(c*x)) + b
*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2-d\right)^2x^2}{\left(b\arcsin(cx)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

3.438 $\int \frac{x(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx$

Optimal. Leaf size=373

$$\frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2}+\frac{5\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{Fresnel}}{8b^{3/2}c^2}$$

```
[Out] (-2*d^2*x*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(8*b^(3/2)*c^2) + (5*d^2*Sqrt[Pi]*Cos[(2*a)/b]*
FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^2) +
 (5*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*S
in[(2*a)/b])/(8*b^(3/2)*c^2) + (d^2*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*
FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(8*b
^(3/2)*c^2)
```

Rubi [A] time = 1.40087, antiderivative size = 373, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.37, Rules used = {4721, 4661, 3312, 3306, 3305, 3351, 3304, 3352, 4723, 4406}

$$\frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2}+\frac{5\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{Fresnel}}{8b^{3/2}c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```


```
[Out] (-2*d^2*x*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(8*b^(3/2)*c^2) + (5*d^2*Sqrt[Pi]*Cos[(2*a)/b]*
FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^2) +
 (5*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*S
in[(2*a)/b])/(8*b^(3/2)*c^2) + (d^2*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*
FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(8*b
^(3/2)*c^2)
```


Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
```

```
0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{x\left(d-c^2dx^2\right)^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2d^2x\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(2d^2\right)\int\frac{\left(1-c^2x^2\right)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{\left(12cd^2\right)\int\frac{x^2\left(1-c^2x^2\right)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d^2x\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(2d^2\right)\text{Subst}\left(\int\frac{\cos^4(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{bc^2} - \frac{\left(12d^2\right)\text{Subst}\left(\int\frac{\cos^4(x)\sin^2}{\sqrt{a+bx}}\right.}{bc^2}$$

$$= -\frac{2d^2x\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(2d^2\right)\text{Subst}\left(\int\left(\frac{3}{8\sqrt{a+bx}}+\frac{\cos(2x)}{2\sqrt{a+bx}}+\frac{\cos(4x)}{8\sqrt{a+bx}}\right)dx,x,\sin^{-1}(cx)\right)}{bc^2} - \frac{(12d}{}$$

$$= -\frac{2d^2x\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\,\text{Subst}\left(\int\frac{\cos(4x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{4bc^2} - \frac{\left(3d^2\right)\text{Subst}\left(\int\frac{\cos(2x)}{\sqrt{a+bx}}\,dx,x,s\right.}{8bc^2}$$

$$= -\frac{2d^2x\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{8bc^2} + \frac{\left(d^2\cos\left(\frac{2a}{b}\right)\right)}{}$$

$$= -\frac{2d^2x\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\sin^{-1}(cx)}\right)}{4b^2c^2} + \frac{\left(2d^2\,c\right.}{}$$

$$= -\frac{2d^2x\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)C\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\,s}}{\sqrt{b}}\right.}{8b^{3/2}c^2}$$

Mathematica [C] time = 3.07019, size = 509, normalized size = 1.36

$$d^2\left(\frac{ie^{-\frac{6ia}{b}}\left(11\sqrt{2}e^{\frac{4ia}{b}}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-11\sqrt{2}e^{\frac{8ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-8e^{\frac{2ia}{b}}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamm}\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d^2*(64*(b^(-1))^(3/2)*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[b^(-1)]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[Pi]] + 64*(b^(-1))^(3/2)*Sqrt[Pi]*FresnelS[(2*Sqr
t[b^(-1)]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[Pi]]*Sin[(2*a)/b] + (I*(11*Sqrt[2]*
E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-2*I)*(a +
b*ArcSin[c*x]))/b] - 11*Sqrt[2]*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x])
)/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - 8*E^(((2*I)*a)/b)*Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-4*I)*(a + b*ArcSin[c*x]))/b] + 8*E
^(((10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((4*I)*(a + b*Ar
cSin[c*x]))/b] - Sqrt[6]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6
*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[6]*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSi
n[c*x]))/b]*Gamma[1/2, ((6*I)*(a + b*ArcSin[c*x]))/b] + (10*I)*E^(((6*I)*a)
/b)*Sin[2*ArcSin[c*x]] + (8*I)*E^(((6*I)*a)/b)*Sin[4*ArcSin[c*x]] + (2*I)*E
^(((6*I)*a)/b)*Sin[6*ArcSin[c*x]]))/(b*E^(((6*I)*a)/b)*Sqrt[a + b*ArcSin[c*
```

```
x]])))/(32*c^2)
```

Maple [A] time = 0.086, size = 426, normalized size = 1.1

$$\frac{d^2}{16\,bc^2}\left(2\,\sqrt{3}\sqrt{a+b\arcsin(cx)}\cos\left(6\,\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\sqrt{6}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{b^{-1}}b}\right)\sqrt{\pi}\sqrt{b^{-1}}+2\,\sqrt{3}\sqrt{a+b\arcsin(cx)}\,\mathrm{sir}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] 1/16/c^2*d^2/b*(2*3^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(6*a/b)*FresnelC(2^(1/
2)/Pi^(1/2)*6^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(
1/2)+2*3^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(6*a/b)*FresnelS(2^(1/2)/Pi^(1/2)
*6^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)+8*2^(1
/2)*(a+b*arcsin(c*x))^(1/2)*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(1/b)^(1
/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)+8*2^(1/2)*(a+b*arcsin(c
*x))^(1/2)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b)*Pi^(1/2)*(1/b)^(1/2)+10*(1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x)
)^(1/2)*cos(2*a/b)*FresnelC(2/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b)+10*(1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(2*a/b)*FresnelS(2/Pi
^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-5*sin(2*(a+b*arcsin(c*x))/b-2
*a/b)-4*sin(4*(a+b*arcsin(c*x))/b-4*a/b)-sin(6*(a+b*arcsin(c*x))/b-6*a/b))/
(a+b*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(c^2dx^2-d\right)^2x}{\left(b\arcsin(cx)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int\frac{x}{a\sqrt{a+b\,\mathrm{asin}(cx)}+b\sqrt{a+b\,\mathrm{asin}(cx)}\,\mathrm{asin}(cx)}\,dx+\int-\frac{2c^2x^3}{a\sqrt{a+b\,\mathrm{asin}(cx)}+b\sqrt{a+b\,\mathrm{asin}(cx)}\,\mathrm{asin}(cx)}\,dx+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(x/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(c*
x)), x) + Integral(-2*c**2*x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asi
n(c*x))*asin(c*x)), x) + Integral(c**4*x**5/(a*sqrt(a + b*asin(c*x)) + b*sq
rt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2 - d\right)^2 x}{\left(b \arcsin\left(cx\right) + a\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x/(b*arcsin(c*x) + a)^(3/2), x)
```

3.439 $\int \frac{(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx$

Optimal. Leaf size=390

$$\frac{5\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c}+\frac{5\sqrt{\frac{3\pi}{2}}d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}+\frac{\sqrt{\frac{5\pi}{2}}d^2\sin\left(\frac{5a}{b}\right)\text{Fresn}}{4b^3}$$

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c) - (5*d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) - (d^2*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*
FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) + (5
*d^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[
a/b])/(2*b^(3/2)*c) + (5*d^2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b
*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c) + (d^2*Sqrt[(5*Pi)/2]*F
resnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(4*b^(
3/2)*c)
```

Rubi [A] time = 0.816396, antiderivative size = 390, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4659, 4723, 4406, 3306, 3305, 3351, 3304, 3352}

$$\frac{5\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c}+\frac{5\sqrt{\frac{3\pi}{2}}d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}+\frac{\sqrt{\frac{5\pi}{2}}d^2\sin\left(\frac{5a}{b}\right)\text{Fresn}}{4b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^2/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c) - (5*d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) - (d^2*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*
FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) + (5
*d^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[
a/b])/(2*b^(3/2)*c) + (5*d^2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b
*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c) + (d^2*Sqrt[(5*Pi)/2]*F
resnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(4*b^(
3/2)*c)
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(10cd^2)\int \frac{x(1-c^2x^2)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(10d^2)\,\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(10d^2)\,\text{Subst}\left(\int \left(\frac{\sin(x)}{8\sqrt{a+bx}} + \frac{3\sin(3x)}{16\sqrt{a+bx}} + \frac{\sin(5x)}{16\sqrt{a+bx}}\right) dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(5d^2)\,\text{Subst}\left(\int \frac{\sin(5x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc} - \frac{(5d^2)\,\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,d\right.}{4bc}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(5d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{4bc} - \frac{\left(15d^2\cos\left(\frac{3a}{b}\right.\right.}{}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(5d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right) dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{2b^2c} - \frac{(15d^2}{}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c} - \frac{5d^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+\right.}{}\right.}{4b^{3/2}c}$$

Mathematica [C] time = 2.40087, size = 522, normalized size = 1.34

$$\frac{d^2e^{-\frac{5i(a+b\sin^{-1}(cx))}{b}}\left(10e^{\frac{4ia}{b}+5i\sin^{-1}(cx)}\sqrt{-\frac{i(a+b\sin^{-1}(cx))}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{i(a+b\sin^{-1}(cx))}{b}\right)+10e^{\frac{6ia}{b}+5i\sin^{-1}(cx)}\sqrt{\frac{i(a+b\sin^{-1}(cx))}{b}}\text{Gan}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d - c^2*d*x^2)^2/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d^2*(-E^(((5*I)*a)/b) - 5*E^(((5*I)*a)/b + (2*I)*ArcSin[c*x]) - 10*E^(((5*
I)*a)/b + (4*I)*ArcSin[c*x]) - 10*E^(((5*I)*a)/b + (6*I)*ArcSin[c*x]) - 5*E
^(((5*I)*a)/b + (8*I)*ArcSin[c*x]) - E^(((5*I)*(a + 2*b*ArcSin[c*x]))/b) +
10*E^(((4*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*G
amma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 10*E^(((6*I)*a)/b + (5*I)*ArcSin[
c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b]
 + 5*Sqrt[3]*E^(((2*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c
*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] + 5*Sqrt[3]*E^(((8*I)*a
)/b + (5*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*
(a + b*ArcSin[c*x]))/b] + Sqrt[5]*E^((5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*A
rcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[5]*E^(((5
*I)*(2*a + b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((
5*I)*(a + b*ArcSin[c*x]))/b]))/(16*b*c*E^(((5*I)*(a + b*ArcSin[c*x]))/b)*Sq
rt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.087, size = 446, normalized size = 1.1

$$-\frac{d^2}{8bc}\left(5\sqrt{3}\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin(cx)}\cos\left(3\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\sqrt{3}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{b^{-1}}b}\right)-5\sqrt{3}\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcs}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] -1/8/c*d^2/b*(5*3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2
)*cos(3*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b)-5*3^(1/2)*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*s
in(3*a/b)*FresnelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(
1/2)/b)+(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*5^(1/2)*cos(5*
a/b)*FresnelS(2^(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b)-(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*5^(1/2)*FresnelC(2^
(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*sin(5*a/b)+10
*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(
1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-10*(1/b)^(1/2)*Pi^(1/2
)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^
(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+10*cos((a+b*arcsin(c*x))/b-a/b)+5*cos(3*(a
+b*arcsin(c*x))/b-3*a/b)+cos(5*(a+b*arcsin(c*x))/b-5*a/b))/(a+b*arcsin(c*x)
)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(c^2dx^2-d\right)^2}{\left(b\arcsin(cx)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c^2*d*x^2 - d)^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int-\frac{2c^2x^2}{a\sqrt{a+b\,\mathrm{asin}(cx)}+b\sqrt{a+b\,\mathrm{asin}(cx)}\,\mathrm{asin}(cx)}\,dx+\int\frac{c^4x^4}{a\sqrt{a+b\,\mathrm{asin}(cx)}+b\sqrt{a+b\,\mathrm{asin}(cx)}\,\mathrm{asin}(cx)}\,dx+\int\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(-2*c**2*x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x) + Integral(c**4*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a
 + b*asin(c*x))*asin(c*x)), x) + Integral(1/(a*sqrt(a + b*asin(c*x)) + b*sq
rt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2 - d\right)^2}{\left(b \arcsin\left(cx\right) + a\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2/(b*arcsin(c*x) + a)^(3/2), x)
```

3.440 $\int \frac{(d-c^2dx^2)^2}{x(a+b\sin^{-1}(cx))^{3/2}}\,dx$

Optimal. Leaf size=288

$$-\frac{2d^2\text{Unintegrable}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}},x\right)}{bc}-\frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}}-\frac{3\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{Fresnel}}{b^{3/2}}$$

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
b^(3/2) - (3*d^2*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])
/(Sqrt[b]*Sqrt[Pi])])/b^(3/2) - (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/b^(3/2) - (d^2*Sqrt[Pi/2]*Fresn
elS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/b^(3/2) -
 (2*d^2*Unintegrable[1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]]), x])
/(b*c)
```

Rubi [A] time = 1.4632, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(d-c^2dx^2)^2}{x\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
b^(3/2) - (3*d^2*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])
/(Sqrt[b]*Sqrt[Pi])])/b^(3/2) - (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/b^(3/2) - (d^2*Sqrt[Pi/2]*Fresn
elS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/b^(3/2) -
 (2*d^2*Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]]), x])/(
b*c)
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d^2)\int \frac{(1-c^2x^2)^{3/2}}{x^2\sqrt{a+b\sin^{-1}(cx)}}dx}{bc} - \frac{(8cd^2)\int \frac{(1-c^2x^2)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}dx}{b}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(8d^2)\,\mathrm{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{a+bx}}dx, x, \sin^{-1}(cx)\right)}{b} - \frac{(2d^2)\int \left(-\frac{2c}{\sqrt{1-c^2x^2}\sqrt{a}}\right.}{}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(8d^2)\,\mathrm{Subst}\left(\int \left(\frac{3}{8\sqrt{a+bx}} + \frac{\cos(2x)}{2\sqrt{a+bx}} + \frac{\cos(4x)}{8\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{b} -$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} + \frac{2d^2\sqrt{a+b\sin^{-1}(cx)}}{b^2} - \frac{d^2\,\mathrm{Subst}\left(\int \frac{\cos(4x)}{\sqrt{a+bx}}dx, x, \sin^{-1}(cx)\right)}{b} -$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} + \frac{2d^2\sqrt{a+b\sin^{-1}(cx)}}{b^2} - \frac{(2d^2)\,\mathrm{Subst}\left(\int \left(\frac{1}{2\sqrt{a+bx}} - \frac{\cos(2x)}{2\sqrt{a+bx}}\right)dx,\right.}{b}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\,\mathrm{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}dx, x, \sin^{-1}(cx)\right)}{b} - \frac{(2d^2)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin}}}{bc}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}} - \frac{4d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)C\left(\frac{2\sqrt{a}}{}\right.}{b^{3/2}}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}} - \frac{4d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)C\left(\frac{2\sqrt{a}}{}\right.}{b^{3/2}}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}} - \frac{3d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)C\left(\frac{2\sqrt{a}}{}\right.}{b^{3/2}}$$

Mathematica [A] time = 3.5083, size = 0, normalized size = 0.

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\sin^{-1}(cx))^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Integrate[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A] time = 0.404, size = 0, normalized size = 0.

$$\int \frac{(-c^2dx^2+d)^2}{x}(a+b\arcsin(cx))^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2-d\right)^2}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c^2*d*x^2 - d)^2/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$d^2\left(\int -\frac{2c^2x^2}{ax\sqrt{a+b\operatorname{asin}\left(cx\right)}+bx\sqrt{a+b\operatorname{asin}\left(cx\right)}\operatorname{asin}\left(cx\right)}\,dx+\int \frac{c^4x^4}{ax\sqrt{a+b\operatorname{asin}\left(cx\right)}+bx\sqrt{a+b\operatorname{asin}\left(cx\right)}\operatorname{asin}\left(cx\right)}\,dx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2/x/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(-2*c**2*x**2/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b*asi
n(c*x))*asin(c*x)), x) + Integral(c**4*x**4/(a*x*sqrt(a + b*asin(c*x)) + b*
x*sqrt(a + b*asin(c*x))*asin(c*x)), x) + Integral(1/(a*x*sqrt(a + b*asin(c*
x)) + b*x*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(c^2dx^2-d\right)^2}{\left(b\arcsin\left(cx\right)+a\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")

[Out] integrate((c^2*d*x^2 - d)^2/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

3.441 $\int \left(-\frac{3x}{8(1-x^2)\sqrt{\sin^{-1}(x)}}+\frac{x\sin^{-1}(x)^{3/2}}{(1-x^2)^2}\right)dx$

Optimal. Leaf size=42

$$\frac{\sin^{-1}(x)^{3/2}}{2(1-x^2)}-\frac{3x\sqrt{\sin^{-1}(x)}}{4\sqrt{1-x^2}}$$

```
[Out] (-3*x*Sqrt[ArcSin[x]])/(4*Sqrt[1 - x^2]) + ArcSin[x]^(3/2)/(2*(1 - x^2))
```

Rubi [A] time = 0.150535, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4677, 4651}

$$\frac{\sin^{-1}(x)^{3/2}}{2(1-x^2)}-\frac{3x\sqrt{\sin^{-1}(x)}}{4\sqrt{1-x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x^2)^2,
x]
```

```
[Out] (-3*x*Sqrt[ArcSin[x]])/(4*Sqrt[1 - x^2]) + ArcSin[x]^(3/2)/(2*(1 - x^2))
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}\int \left(-\frac{3x}{8(1-x^2)\sqrt{\sin^{-1}(x)}}+\frac{x\sin^{-1}(x)^{3/2}}{(1-x^2)^2}\right)dx &= -\left(\frac{3}{8}\int \frac{x}{(1-x^2)\sqrt{\sin^{-1}(x)}}\,dx\right)+\int \frac{x\sin^{-1}(x)^{3/2}}{(1-x^2)^2}\,dx\\ &= \frac{\sin^{-1}(x)^{3/2}}{2(1-x^2)}-\frac{3}{8}\int \frac{x}{(1-x^2)\sqrt{\sin^{-1}(x)}}\,dx-\frac{3}{4}\int \frac{\sqrt{\sin^{-1}(x)}}{(1-x^2)^{3/2}}\,dx\\ &= -\frac{3x\sqrt{\sin^{-1}(x)}}{4\sqrt{1-x^2}}+\frac{\sin^{-1}(x)^{3/2}}{2(1-x^2)}\end{aligned}$$

Mathematica [F] time = 3.52706, size = 0, normalized size = 0.

$$\int \left(-\frac{3x}{8(1-x^2)\sqrt{\sin^{-1}(x)}} + \frac{x\sin^{-1}(x)^{3/2}}{(1-x^2)^2} \right) dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x
^2)^2,x]
```

```
[Out] Integrate[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x
^2)^2, x]
```

Maple [F] time = 0.218, size = 0, normalized size = 0.

$$\int \frac{x}{(-x^2+1)^2} (\arcsin(x))^{\frac{3}{2}} - \frac{3x}{-8x^2+8} \frac{1}{\sqrt{\arcsin(x)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x)
```

```
[Out] int(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int -\frac{3x}{x^4\sqrt{\operatorname{asin}(x)}-2x^2\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\,dx+\int \frac{3x^3}{x^4\sqrt{\operatorname{asin}(x)}-2x^2\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\,dx+\int \frac{8x\operatorname{asin}^2(x)}{x^4\sqrt{\operatorname{asin}(x)}-2x^2\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\,dx}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(x)**(3/2)/(-x**2+1)**2-3/8*x/(-x**2+1)/asin(x)**(1/2),x)
```

```
[Out] (Integral(-3*x/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin(x)) + sqrt(asin(x))),
 x) + Integral(3*x**3/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin(x)) + sqrt(asi
n(x))), x) + Integral(8*x*asin(x)**2/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin
(x)) + sqrt(asin(x))), x))/8
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\arcsin(x)^{\frac{3}{2}}}{\left(x^2-1\right)^2}+\frac{3\,x}{8\left(x^2-1\right)\sqrt{\arcsin(x)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="giac")
```

```
[Out] integrate(x*arcsin(x)^(3/2)/(x^2 - 1)^2 + 3/8*x/((x^2 - 1)*sqrt(arcsin(x)))
, x)
```

3.442 $\int \left(c-a^2cx^2\right)^{3/2} \sqrt{\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=227

$$-\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{64a\sqrt{1-a^2x^2}}-\frac{\sqrt{\pi}c\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-a^2cx^2}}{4a\sqrt{1}}$$

```
[Out] (3*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/8 + (x*(c - a^2*c*x^2)^(3/2)*
Sqrt[ArcSin[a*x]])/4 + (c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(4*a*Sqrt[
1 - a^2*x^2]) - (c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqr
t[ArcSin[a*x]]])/(64*a*Sqrt[1 - a^2*x^2]) - (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.282997, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4649, 4647, 4641, 4635, 4406, 12, 3305, 3351, 4723}

$$-\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{64a\sqrt{1-a^2x^2}}-\frac{\sqrt{\pi}c\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-a^2cx^2}}{4a\sqrt{1}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]],x]
```


```
[Out] (3*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/8 + (x*(c - a^2*c*x^2)^(3/2)*
Sqrt[ArcSin[a*x]])/4 + (c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(4*a*Sqrt[
1 - a^2*x^2]) - (c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqr
t[ArcSin[a*x]]])/(64*a*Sqrt[1 - a^2*x^2]) - (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
```

```
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}\,dx = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}\,dx-\frac{\left(ac\sqrt{c-a^2cx^2}\right.}{8\sqrt{1}}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{\left(3c\sqrt{c-a^2cx^2}\right)\int\frac{\sqrt{\sin}}{\sqrt{1}}}{8\sqrt{1-a^2x^2}}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-a^2cx^2}\sin^{-1}(ax)}{4a\sqrt{1-a^2x^2}}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-a^2cx^2}\sin^{-1}(ax)}{4a\sqrt{1-a^2x^2}}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-a^2cx^2}\sin^{-1}(ax)}{4a\sqrt{1-a^2x^2}}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-a^2cx^2}\sin^{-1}(ax)}{4a\sqrt{1-a^2x^2}}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-a^2cx^2}\sin^{-1}(ax)}{4a\sqrt{1-a^2x^2}}$$

Mathematica [C] time = 0.21993, size = 166, normalized size = 0.73

$$\frac{c\sqrt{c-a^2cx^2}\left(8\sqrt{2}\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{3}{2},-2i\sin^{-1}(ax)\right)+8\sqrt{2}\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{3}{2},2i\sin^{-1}(ax)\right)+\sqrt{-i\sin^{-}}\right.}{128a\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(32*ArcSin[a*x]^2 + 8*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]
*Gamma[3/2, (-2*I)*ArcSin[a*x]] + 8*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[3/2,
(2*I)*ArcSin[a*x]] + Sqrt[(-I)*ArcSin[a*x]]*Gamma[3/2, (-4*I)*ArcSin[a*x]]
+ Sqrt[I*ArcSin[a*x]]*Gamma[3/2, (4*I)*ArcSin[a*x]]))/(128*a*Sqrt[1 - a^2*x
^2]*Sqrt[ArcSin[a*x]])
```

Maple [F] time = 0.197, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{\frac{3}{2}}\sqrt{\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-a^2cx^2 + c\right)^{\frac{3}{2}} \sqrt{\arcsin\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)*sqrt(arcsin(a*x)), x)
```

3.443 $\int \sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}\,dx$

Optimal. Leaf size=130

$$-\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}$$

```
[Out] (x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a
*x]^(3/2))/(3*a*Sqrt[1 - a^2*x^2]) - (Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS
[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.117625, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4647, 4641, 4635, 4406, 12, 3305, 3351}

$$-\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a
*x]^(3/2))/(3*a*Sqrt[1 - a^2*x^2]) - (Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS
[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\begin{aligned}
\int \sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}\,dx &= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{\sqrt{c-a^2cx^2}\int \frac{\sqrt{\sin^{-1}(ax)}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}}-\frac{\left(a\sqrt{c-a^2cx^2}\right)\int \frac{x}{\sqrt{\sin^{-1}(ax)}}\,dx}{4\sqrt{1-a^2x^2}}\\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}-\frac{\sqrt{c-a^2cx^2}\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx\right.}{4a\sqrt{1-a^2x^2}}\\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}-\frac{\sqrt{c-a^2cx^2}\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\right.}{4a\sqrt{1-a^2x^2}}\\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}-\frac{\sqrt{c-a^2cx^2}\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx,x,\right.}{8a\sqrt{1-a^2x^2}}\\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}-\frac{\sqrt{c-a^2cx^2}\,\mathrm{Subst}\left(\int \sin\left(2x^2\right)\,dx,\right.}{4a\sqrt{1-a^2x^2}}\\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}-\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}
\end{aligned}$$

Mathematica [C] time = 0.0671401, size = 138, normalized size = 1.06

$$\frac{\sqrt{c-a^2cx^2}\left(3\sqrt{2}\sqrt{-i\sin^{-1}(ax)}\mathrm{Gamma}\left(\frac{1}{2},-2i\sin^{-1}(ax)\right)+3\sqrt{2}\sqrt{i\sin^{-1}(ax)}\mathrm{Gamma}\left(\frac{1}{2},2i\sin^{-1}(ax)\right)+16\sin^{-1}(ax)\left(\right.\right.}{96a\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*(16*ArcSin[a*x]*(3*a*x*Sqrt[1 - a^2*x^2] + 2*ArcSin[a*
x]) + 3*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] + 3*S
qrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[a*x]]))/(96*a*Sqrt[1 - a
^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F] time = 0.231, size = 0, normalized size = 0.

$$\int \sqrt{-a^2cx^2+c}\,\sqrt{\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c(ax-1)(ax+1)}\,\sqrt{\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(1/2),x)
```

```
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*sqrt(asin(a*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-a^2cx^2+c}\,\sqrt{\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)*sqrt(arcsin(a*x)), x)
```

3.444 $\int \frac{\sqrt{\sin^{-1}(ax)}}{\sqrt{c-a^2cx^2}} dx$

Optimal. Leaf size=44

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))/(3*a*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0752011, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcSin[a*x]]/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))/(3*a*Sqrt[c - a^2*c*x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\sin^{-1}(ax)}}{\sqrt{c-a^2cx^2}} dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sqrt{\sin^{-1}(ax)}}{\sqrt{1-a^2x^2}} dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.0465079, size = 44, normalized size = 1.

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[ArcSin[a*x]]/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))/(3*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.039, size = 38, normalized size = 0.9

$$\frac{2}{3a}(\arcsin(ax))^{\frac{3}{2}}\sqrt{-a^2x^2+1}\frac{1}{\sqrt{-c\left(a^2x^2-1\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 2/3*arcsin(a*x)^(3/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\operatorname{asin}(ax)}}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(asin(a*x))/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{-a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(arcsin(a*x))/sqrt(-a^2*c*x^2 + c), x)
```

3.445 $\int \frac{\sqrt{\sin^{-1}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=90

$$\frac{x\sqrt{\sin^{-1}(ax)}}{c\sqrt{c-a^2cx^2}}-\frac{a\sqrt{1-a^2x^2}\text{Unintegrable}\left(\frac{x}{(1-a^2x^2)\sqrt{\sin^{-1}(ax)}},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] (x*Sqrt[ArcSin[a*x]])/(c*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Uninte
grable[x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0949667, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{\sin^{-1}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2),x]

[Out] (x*Sqrt[ArcSin[a*x]])/(c*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Defer[
Int][x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{\sqrt{\sin^{-1}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx=\frac{x\sqrt{\sin^{-1}(ax)}}{c\sqrt{c-a^2cx^2}}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)\sqrt{\sin^{-1}(ax)}}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [A] time = 0.619456, size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sin^{-1}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2),x]

[Out] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2), x]
```

Maple [A] time = 0.235, size = 0, normalized size = 0.

$$\int \sqrt{\arcsin(ax)}\left(-a^2cx^2+c\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\operatorname{asin}(ax)}}{(-c(ax-1)(ax+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(sqrt(asin(a*x))/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin(ax)}}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(arcsin(a*x))/(-a^2*c*x^2 + c)^(3/2), x)
```

3.446 $\int \frac{\sqrt{\sin^{-1}(ax)}}{\left(c-a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=185

$$-\frac{a\sqrt{1-a^2x^2}\,\text{Unintegrable}\left(\frac{x}{\left(1-a^2x^2\right)^2\sqrt{\sin^{-1}(ax)}},x\right)}{6c^2\sqrt{c-a^2cx^2}}-\frac{a\sqrt{1-a^2x^2}\,\text{Unintegrable}\left(\frac{x}{\left(1-a^2x^2\right)\sqrt{\sin^{-1}(ax)}},x\right)}{3c^2\sqrt{c-a^2cx^2}}+\frac{2x\sqrt{\sin^{-1}(ax)}}{3c^2\sqrt{c-a^2cx^2}}$$

```
[Out] (x*Sqrt[ArcSin[a*x]])/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Sqrt[ArcSin[a*x]])
/(3*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Unintegrable[x/((1 - a^
2*x^2)^2*Sqrt[ArcSin[a*x]]), x])/(6*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 -
a^2*x^2]*Unintegrable[x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(3*c^2*Sqrt[
c - a^2*c*x^2])
```

Rubi [A] time = 0.188572, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{\sin^{-1}(ax)}}{\left(c-a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (x*Sqrt[ArcSin[a*x]])/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Sqrt[ArcSin[a*x]])
/(3*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*
x^2)^2*Sqrt[ArcSin[a*x]]), x])/(6*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^
2*x^2]*Defer[Int][x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(3*c^2*Sqrt[c -
a^2*c*x^2])
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\sin^{-1}(ax)}}{\left(c-a^2cx^2\right)^{5/2}}\,dx&=\frac{x\sqrt{\sin^{-1}(ax)}}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2\int \frac{\sqrt{\sin^{-1}(ax)}}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{3c}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{\left(1-a^2x^2\right)^2\sqrt{\sin^{-1}(ax)}}\,dx}{6c^2\sqrt{c-a^2cx^2}}\\&=\frac{x\sqrt{\sin^{-1}(ax)}}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2x\sqrt{\sin^{-1}(ax)}}{3c^2\sqrt{c-a^2cx^2}}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{\left(1-a^2x^2\right)^2\sqrt{\sin^{-1}(ax)}}\,dx}{6c^2\sqrt{c-a^2cx^2}}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{\left(1-a^2x^2\right)\sqrt{\sin^{-1}(ax)}}\,dx}{3c^2\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 1.721, size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sin^{-1}(ax)}}{\left(c-a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2), x]
```

Maple [A] time = 0.296, size = 0, normalized size = 0.

$$\int \sqrt{\arcsin(ax)}\left(-a^2cx^2+c\right)^{-\frac{5}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin(ax)}}{\left(-a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(arcsin(a*x))/(-a^2*c*x^2 + c)^(5/2), x)
```

3.447 $\int \left(c-a^2cx^2\right)^{3/2} \sin^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=363

$$-\frac{3\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{512a\sqrt{1-a^2x^2}}-\frac{3\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{3c\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}{20a\sqrt{1-a^2x^2}}$$

```
[Out] (27*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(256*a*Sqrt[1 - a^2*x^2]) - (9
*a*c*x^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*Sqrt[1 - a^2*x^2]) + (3
*c*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*a) + (3*c
*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcS
in[a*x]^(3/2))/4 + (3*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2))/(20*a*Sqrt[1
 - a^2*x^2]) - (3*c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sq
rt[ArcSin[a*x]]])/(512*a*Sqrt[1 - a^2*x^2]) - (3*c*Sqrt[Pi]*Sqrt[c - a^2*c*
x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.433735, antiderivative size = 363, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4649, 4647, 4641, 4629, 4723, 3312, 3304, 3352, 4677, 4661}

$$-\frac{3\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{512a\sqrt{1-a^2x^2}}-\frac{3\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{3c\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}{20a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2),x]
```


```
[Out] (27*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(256*a*Sqrt[1 - a^2*x^2]) - (9
*a*c*x^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*Sqrt[1 - a^2*x^2]) + (3
*c*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*a) + (3*c
*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcS
in[a*x]^(3/2))/4 + (3*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2))/(20*a*Sqrt[1
 - a^2*x^2]) - (3*c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sq
rt[ArcSin[a*x]]])/(512*a*Sqrt[1 - a^2*x^2]) - (3*c*Sqrt[Pi]*Sqrt[c - a^2*c*
x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}\,dx = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}+\frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}\,dx-\frac{\left(3ac\sqrt{c-a^2cx^2}\right.}{}$$

$$=\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}+\frac{1}{4}x\left(c-a^2cx^2\right)$$

$$=-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32a}+\frac{3}{8}cx\sqrt{c-a^2}$$

$$=-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32a}+\frac{3}{8}cx\sqrt{c-a^2}$$

$$=-\frac{9c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2c}}{32a}$$

$$=\frac{27c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2c}}{32a}$$

$$=\frac{27c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2c}}{32a}$$

$$=\frac{27c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2c}}{32a}$$

Mathematica [C] time = 0.425425, size = 186, normalized size = 0.51

$$\frac{c\sqrt{c-a^2cx^2}\left(-240\sqrt{\pi}\sqrt{\sin^{-1}(ax)^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)+\sqrt{\sin^{-1}(ax)}\left(5\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{5}{2},-4i\sin^{-1}(ax)\right)+5\sqrt{}\right.\right.}{2560a\sqrt{1-}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(-240*Sqrt[Pi]*Sqrt[ArcSin[a*x]^2]*FresnelC[(2*Sqrt[
ArcSin[a*x]])/Sqrt[Pi]] + Sqrt[ArcSin[a*x]]*(5*Sqrt[I*ArcSin[a*x]]*Gamma[5/
2, (-4*I)*ArcSin[a*x]] + 5*Sqrt[(-I)*ArcSin[a*x]]*Gamma[5/2, (4*I)*ArcSin[a
*x]] + 32*Sqrt[ArcSin[a*x]^2]*(12*ArcSin[a*x]^2 + 15*Cos[2*ArcSin[a*x]] + 2
0*ArcSin[a*x]*Sin[2*ArcSin[a*x]]))))/(2560*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[
a*x]^2])
```

Maple [F] time = 0.179, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{\frac{3}{2}}\left(\arcsin(ax)\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-a^2cx^2 + c\right)^{\frac{3}{2}} \arcsin\left(ax\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(3/2), x)
```

3.448 $\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=219

$$-\frac{3\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}-\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}}$$

```
[Out] (3*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(16*a*Sqrt[1 - a^2*x^2]) - (3*a*x
^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c
 - a^2*c*x^2]*ArcSin[a*x]^(3/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)
)/(5*a*Sqrt[1 - a^2*x^2]) - (3*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqr
t[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.224987, antiderivative size = 219, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4647, 4641, 4629, 4723, 3312, 3304, 3352}

$$-\frac{3\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}-\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2),x]
```

```
[Out] (3*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(16*a*Sqrt[1 - a^2*x^2]) - (3*a*x
^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c
 - a^2*c*x^2]*ArcSin[a*x]^(3/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)
)/(5*a*Sqrt[1 - a^2*x^2]) - (3*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqr
t[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\int \frac{\sin^{-1}(ax)^{3/2}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} - \frac{\left(3a\sqrt{c-a^2cx^2}\right)\int x\sqrt{\sin^{-1}}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{1-a^2x^2}}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{1-a^2x^2}}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{1-a^2x^2}}$$

$$= \frac{3\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2} +$$

$$= \frac{3\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2} +$$

$$= \frac{3\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2} +$$

Mathematica [C] time = 0.107527, size = 158, normalized size = 0.72

$$\frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}\left(15\sqrt{2}\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{3}{2},-2i\sin^{-1}(ax)\right)+15\sqrt{2}\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{3}{2},2i\sin^{-1}(ax)\right)\right.}{320a\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2),x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]*(32*ArcSin[a*x]*Sqrt[ArcSin[a*x]^2]*
(5*a*x*Sqrt[1 - a^2*x^2] + 2*ArcSin[a*x]) + 15*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*
Gamma[3/2, (-2*I)*ArcSin[a*x]] + 15*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[3/
2, (2*I)*ArcSin[a*x]]))/(320*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]^2])
```

Maple [F] time = 0.234, size = 0, normalized size = 0.

$$\int \sqrt{-a^2cx^2+c}\,(\arcsin(ax))^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-a^2cx^2 + c} \arcsin(ax)^{\frac{3}{2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(3/2), x)
```

3.449 $\int \frac{\sin^{-1}(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=44

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[c - a^2*c*x^2])

Rubi [A] time = 0.0724626, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

[In] Int[ArcSin[a*x]^(3/2)/Sqrt[c - a^2*c*x^2],x]

[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[c - a^2*c*x^2])

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^{3/2}}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.0556255, size = 44, normalized size = 1.

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

[In] Integrate[ArcSin[a*x]^(3/2)/Sqrt[c - a^2*c*x^2],x]

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.037, size = 38, normalized size = 0.9

$$\frac{2}{5a}(\arcsin(ax))^{\frac{5}{2}}\sqrt{-a^2x^2+1}\frac{1}{\sqrt{-c(a^2x^2-1)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 2/5*arcsin(a*x)^(5/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{asin}^{\frac{3}{2}}(ax)}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(3/2)/(-a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**(3/2)/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^{\frac{3}{2}}}{\sqrt{-a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(3/2)/sqrt(-a^2*c*x^2 + c), x)
```

3.450 $\int \frac{\sin^{-1}(ax)^{3/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=90

$$\frac{x\sin^{-1}(ax)^{3/2}}{c\sqrt{c-a^2cx^2}}-\frac{3a\sqrt{1-a^2x^2}\,\text{Unintegrable}\left(\frac{x\sqrt{\sin^{-1}(ax)}}{1-a^2x^2},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] (x*ArcSin[a*x]^(3/2))/(c*Sqrt[c - a^2*c*x^2]) - (3*a*Sqrt[1 - a^2*x^2]*Unin
tegrable[(x*Sqrt[ArcSin[a*x]])/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0880517, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sin^{-1}(ax)^{3/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^(3/2))/(c*Sqrt[c - a^2*c*x^2]) - (3*a*Sqrt[1 - a^2*x^2]*Defe
r[Int][(x*Sqrt[ArcSin[a*x]])/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^{3/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx=\frac{x\sin^{-1}(ax)^{3/2}}{c\sqrt{c-a^2cx^2}}-\frac{\left(3a\sqrt{1-a^2x^2}\right)\int \frac{x\sqrt{\sin^{-1}(ax)}}{1-a^2x^2}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [A] time = 0.700269, size = 0, normalized size = 0.

$$\int \frac{\sin^{-1}(ax)^{3/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] Integrate[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2), x]
```

Maple [A] time = 0.208, size = 0, normalized size = 0.

$$\int (\arcsin(ax))^{\frac{3}{2}}\left(-a^2cx^2+c\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(3/2)/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin\left(ax\right)^{\frac{3}{2}}}{\left(-a^{2}cx^{2}+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2 + c)^(3/2), x)
```

3.451 $\int \left(c-a^2 c x^2\right)^{3/2} \sin^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=431

$$\frac{15\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{4096a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}c\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}+\frac{3c\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{7/2}}{28a\sqrt{1-a^2x^2}}+\frac{1}{4}x\left(c-a^2c\right.$$

```
[Out] (-225*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/512 - (15*c*x*(1 - a^2*x^2
)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/256 + (45*c*Sqrt[c - a^2*c*x^2]*Ar
cSin[a*x]^(3/2))/(256*a*Sqrt[1 - a^2*x^2]) - (15*a*c*x^2*Sqrt[c - a^2*c*x^2
]*ArcSin[a*x]^(3/2))/(32*Sqrt[1 - a^2*x^2]) + (5*c*(1 - a^2*x^2)^(3/2)*Sqrt
[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(32*a) + (3*c*x*Sqrt[c - a^2*c*x^2]*ArcS
in[a*x]^(5/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2))/4 + (3*c*Sqr
t[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(28*a*Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[P
i/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(4096*a*
Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[Ar
cSin[a*x]])/Sqrt[Pi]])/(128*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.577838, antiderivative size = 431, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4649, 4647, 4641, 4629, 4707, 4635, 4406, 12, 3305, 3351, 4677, 4723}

$$\frac{15\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{4096a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}c\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}+\frac{3c\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{7/2}}{28a\sqrt{1-a^2x^2}}+\frac{1}{4}x\left(c-a^2c\right.$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2),x]
```


```
[Out] (-225*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/512 - (15*c*x*(1 - a^2*x^2
)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/256 + (45*c*Sqrt[c - a^2*c*x^2]*Ar
cSin[a*x]^(3/2))/(256*a*Sqrt[1 - a^2*x^2]) - (15*a*c*x^2*Sqrt[c - a^2*c*x^2
]*ArcSin[a*x]^(3/2))/(32*Sqrt[1 - a^2*x^2]) + (5*c*(1 - a^2*x^2)^(3/2)*Sqrt
[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(32*a) + (3*c*x*Sqrt[c - a^2*c*x^2]*ArcS
in[a*x]^(5/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2))/4 + (3*c*Sqr
t[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(28*a*Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[P
i/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(4096*a*
Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[Ar
cSin[a*x]])/Sqrt[Pi]])/(128*a*Sqrt[1 - a^2*x^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
```

```
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}\,dx = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}+\frac{1}{4}(3c)\int\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}\,dx-\frac{\left(5ac\sqrt{c-a^2c\right.}{}$$

$$=\frac{5c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{32a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}+\frac{1}{4}x\left(c-a^2\right.$$

$$=-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15acx^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{32\sqrt{1-a^2x^2}}+\frac{5c\left(1\right.}{}$$

$$=-\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15acx^2}{}$$

$$=-\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{45c\sqrt{c}}{2}$$

$$=-\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{45c\sqrt{c}}{2}$$

$$=-\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{45c\sqrt{c}}{2}$$

$$=-\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{45c\sqrt{c}}{2}$$

$$=-\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{45c\sqrt{c}}{2}$$

Mathematica [C] time = 0.317277, size = 180, normalized size = 0.42

$$\frac{c\sqrt{c-a^2cx^2}\left(-7\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{7}{2},-4i\sin^{-1}(ax)\right)-7\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{7}{2},4i\sin^{-1}(ax)\right)+1680\sqrt{\pi}\sqrt{\sin^{-1}}\right.}{1}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(1536*ArcSin[a*x]^4 + 4480*ArcSin[a*x]^2*Cos[2*ArcSi
n[a*x]] + 1680*Sqrt[Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sq
rt[Pi]] - 7*Sqrt[(-I)*ArcSin[a*x]]*Gamma[7/2, (-4*I)*ArcSin[a*x]] - 7*Sqrt[
I*ArcSin[a*x]]*Gamma[7/2, (4*I)*ArcSin[a*x]] - 3360*ArcSin[a*x]*Sin[2*ArcSi
n[a*x]] + 3584*ArcSin[a*x]^3*Sin[2*ArcSin[a*x]]))/(14336*a*Sqrt[1 - a^2*x^2
]*Sqrt[ArcSin[a*x]])
```

Maple [F] time = 0.18, size = 0, normalized size = 0.

$$\int \left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \left(\arcsin \left(a x \right)\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{\frac{3}{2}} \arcsin\left(ax\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(5/2), x)
```

3.452 $\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=247

$$\frac{15\sqrt{\pi}\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{7/2}}{7a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}-\frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}}+$$

```
[Out] (-15*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/32 + (5*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(16*a*Sqrt[1 - a^2*x^2]) - (5*a*x^2*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x
]^(5/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[1 - a^2*x^2]
) + (15*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi
]])/(128*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.249361, antiderivative size = 247, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4647, 4641, 4629, 4707, 4635, 4406, 12, 3305, 3351}

$$\frac{15\sqrt{\pi}\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{7/2}}{7a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}-\frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}}+$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2),x]
```


```
[Out] (-15*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/32 + (5*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(16*a*Sqrt[1 - a^2*x^2]) - (5*a*x^2*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x
]^(5/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[1 - a^2*x^2]
) + (15*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi
]])/(128*a*Sqrt[1 - a^2*x^2])
```


Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2} + \frac{\sqrt{c-a^2cx^2}\int \frac{\sin^{-1}(ax)^{5/2}}{\sqrt{1-a^2x^2}}dx}{2\sqrt{1-a^2x^2}} - \frac{\left(5a\sqrt{c-a^2cx^2}\right)\int x\sin^{-1}(ax)^3}{4\sqrt{1-a^2x^2}}$$

$$= -\frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2} + \frac{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{7/2}}{7a\sqrt{1-a^2x^2}} +$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)} - \frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} +$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} +$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} +$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} +$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} +$$

Mathematica [C] time = 0.123455, size = 158, normalized size = 0.64

$$\frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}\left(35i\sqrt{2}\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{5}{2},-2i\sin^{-1}(ax)\right) - 35i\sqrt{2}\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{5}{2},2i\sin^{-1}(ax)\right)\right.}{896a\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2),x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]*(64*(ArcSin[a*x]^2)^(3/2)*(7*a*x*Sqr
t[1 - a^2*x^2] + 2*ArcSin[a*x]) + (35*I)*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[
5/2, (-2*I)*ArcSin[a*x]] - (35*I)*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[5/2,
 (2*I)*ArcSin[a*x]]))/(896*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]^2])
```

Maple [F] time = 0.234, size = 0, normalized size = 0.

$$\int \sqrt{-a^2cx^2+c}\,(\arcsin(ax))^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-a^2cx^2+c}\arcsin{(ax)}^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(5/2), x)
```

3.453 $\int \frac{\sin^{-1}(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=44

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0693307, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^(5/2)/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[c - a^2*c*x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] && !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^{5/2}}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.0534157, size = 44, normalized size = 1.

$$\frac{2\sqrt{1-a^2x^2}\sin^{-1}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^(5/2)/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.038, size = 38, normalized size = 0.9

$$\frac{2}{7a}(\arcsin(ax))^{\frac{7}{2}}\sqrt{-a^2x^2+1}\frac{1}{\sqrt{-c(a^2x^2-1)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 2/7*arcsin(a*x)^(7/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(5/2)/(-a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^{\frac{5}{2}}}{\sqrt{-a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(5/2)/sqrt(-a^2*c*x^2 + c), x)
```

3.454 $\int \frac{\sin^{-1}(ax)^{5/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=90

$$\frac{x\sin^{-1}(ax)^{5/2}}{c\sqrt{c-a^2cx^2}}-\frac{5a\sqrt{1-a^2x^2}\text{Unintegrable}\left(\frac{x\sin^{-1}(ax)^{3/2}}{1-a^2x^2},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] (x*ArcSin[a*x]^(5/2))/(c*Sqrt[c - a^2*c*x^2]) - (5*a*Sqrt[1 - a^2*x^2]*Unin
tegrable[(x*ArcSin[a*x]^(3/2))/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0851827, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sin^{-1}(ax)^{5/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^(5/2))/(c*Sqrt[c - a^2*c*x^2]) - (5*a*Sqrt[1 - a^2*x^2]*Defe
r[Int][(x*ArcSin[a*x]^(3/2))/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^{5/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx=\frac{x\sin^{-1}(ax)^{5/2}}{c\sqrt{c-a^2cx^2}}-\frac{\left(5a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)^{3/2}}{1-a^2x^2}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [A] time = 0.676248, size = 0, normalized size = 0.

$$\int \frac{\sin^{-1}(ax)^{5/2}}{\left(c-a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] Integrate[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2), x]
```

Maple [A] time = 0.238, size = 0, normalized size = 0.

$$\int (\arcsin(ax))^{\frac{5}{2}}\left(-a^2cx^2+c\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(5/2)/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^{\frac{5}{2}}}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2 + c)^(3/2), x)
```

3.455 $\int \left(a^2-x^2\right)^{3/2} \sqrt{\sin^{-1}\left(\frac{x}{a}\right)} \, dx$

Optimal. Leaf size=226

$$-\frac{\sqrt{\frac{\pi}{2}} a^3 \sqrt{a^2-x^2} S\left(2 \sqrt{\frac{2}{\pi}} \sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\right)}{64 \sqrt{1-\frac{x^2}{a^2}}}-\frac{\sqrt{\pi} a^3 \sqrt{a^2-x^2} S\left(\frac{2 \sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8 \sqrt{1-\frac{x^2}{a^2}}}+\frac{a^3 \sqrt{a^2-x^2} \sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{4 \sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8} a^2 x \sqrt{a^2-x^2} \sqrt{\sin}$$

```
[Out] (3*a^2*x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/8 + (x*(a^2 - x^2)^(3/2)*Sqrt[A
rcSin[x/a]])/4 + (a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2))/(4*Sqrt[1 - x^2/a^
2]) - (a^3*Sqrt[Pi/2]*Sqrt[a^2 - x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a
]]])/(64*Sqrt[1 - x^2/a^2]) - (a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqr
t[ArcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```

Rubi [A] time = 0.236683, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4649, 4647, 4641, 4635, 4406, 12, 3305, 3351, 4723}

$$-\frac{\sqrt{\frac{\pi}{2}} a^3 \sqrt{a^2-x^2} S\left(2 \sqrt{\frac{2}{\pi}} \sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\right)}{64 \sqrt{1-\frac{x^2}{a^2}}}-\frac{\sqrt{\pi} a^3 \sqrt{a^2-x^2} S\left(\frac{2 \sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8 \sqrt{1-\frac{x^2}{a^2}}}+\frac{a^3 \sqrt{a^2-x^2} \sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{4 \sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8} a^2 x \sqrt{a^2-x^2} \sqrt{\sin}$$

Antiderivative was successfully verified.

```
[In] Int[(a^2 - x^2)^(3/2)*Sqrt[ArcSin[x/a]],x]
```


```
[Out] (3*a^2*x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/8 + (x*(a^2 - x^2)^(3/2)*Sqrt[A
rcSin[x/a]])/4 + (a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2))/(4*Sqrt[1 - x^2/a^
2]) - (a^3*Sqrt[Pi/2]*Sqrt[a^2 - x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a
]]])/(64*Sqrt[1 - x^2/a^2]) - (a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqr
t[ArcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rubi steps

$$\int \left(a^2-x^2\right)^{3/2} \sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\,dx = \frac{1}{4}x\left(a^2-x^2\right)^{3/2} \sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}\left(3a^2\right)\int \sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\,dx - \frac{\left(a\sqrt{a^2-x^2}\right)\int \frac{x}{\sqrt{\ldots}}}{8\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} - \frac{\left(3a\sqrt{a^2-x^2}\right)\int \frac{x}{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}}{16\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} -$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} -$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} -$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} -$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} -$$

Mathematica [C] time = 0.200631, size = 183, normalized size = 0.81

$$\frac{a^3\sqrt{a^2-x^2}\left(8\sqrt{2}\sqrt{-i\sin^{-1}\left(\frac{x}{a}\right)}\text{Gamma}\left(\frac{3}{2},-2i\sin^{-1}\left(\frac{x}{a}\right)\right)+8\sqrt{2}\sqrt{i\sin^{-1}\left(\frac{x}{a}\right)}\text{Gamma}\left(\frac{3}{2},2i\sin^{-1}\left(\frac{x}{a}\right)\right)+\sqrt{-i\sin^{-1}\left(\ldots\right.}\right.}{128\sqrt{1-\frac{x^2}{a^2}}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a^2 - x^2)^(3/2)*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (a^3*Sqrt[a^2 - x^2]*(32*ArcSin[x/a]^2 + 8*Sqrt[2]*Sqrt[(-I)*ArcSin[x/a]]*G
amma[3/2, (-2*I)*ArcSin[x/a]] + 8*Sqrt[2]*Sqrt[I*ArcSin[x/a]]*Gamma[3/2, (2
*I)*ArcSin[x/a]] + Sqrt[(-I)*ArcSin[x/a]]*Gamma[3/2, (-4*I)*ArcSin[x/a]] +
Sqrt[I*ArcSin[x/a]]*Gamma[3/2, (4*I)*ArcSin[x/a]]))/(128*Sqrt[1 - x^2/a^2]*
Sqrt[ArcSin[x/a]])
```

Maple [F] time = 0.256, size = 0, normalized size = 0.

$$\int \left(a^2-x^2\right)^{\frac{3}{2}} \sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x)
```

```
[Out] int((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a^2-x^2\right)^{\frac{3}{2}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((a^2 - x^2)^(3/2)*sqrt(arcsin(x/a)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(3/2)*asin(x/a)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a^2-x^2\right)^{\frac{3}{2}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((a^2 - x^2)^(3/2)*sqrt(arcsin(x/a)), x)
```

3.456 $\int \sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\,dx$

Optimal. Leaf size=126

$$-\frac{\sqrt{\pi}a\sqrt{a^2-x^2}S\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}$$

```
[Out] (x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3
/2))/(3*Sqrt[1 - x^2/a^2]) - (a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqrt[A
rcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```

Rubi [A] time = 0.105709, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4647, 4641, 4635, 4406, 12, 3305, 3351}

$$-\frac{\sqrt{\pi}a\sqrt{a^2-x^2}S\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]],x]
```


```
[Out] (x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3
/2))/(3*Sqrt[1 - x^2/a^2]) - (a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqrt[A
rcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```


Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\,dx = \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{\sqrt{a^2-x^2}\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{2\sqrt{1-\frac{x^2}{a^2}}} - \frac{\sqrt{a^2-x^2}\int \frac{x}{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{4a\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx, x,\right.}{4\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx, x, \sin\right.}{4\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \sin\right.}{8\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x,\right.}{4\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{a\sqrt{\pi}\sqrt{a^2-x^2}S\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$

Mathematica [C] time = 0.0719123, size = 148, normalized size = 1.17

$$\frac{\sqrt{a^2-x^2}\left(3\sqrt{2}a\sqrt{-i\sin^{-1}\left(\frac{x}{a}\right)}\text{Gamma}\left(\frac{1}{2},-2i\sin^{-1}\left(\frac{x}{a}\right)\right)+3\sqrt{2}a\sqrt{i\sin^{-1}\left(\frac{x}{a}\right)}\text{Gamma}\left(\frac{1}{2},2i\sin^{-1}\left(\frac{x}{a}\right)\right)+48x\sqrt{1-\frac{x^2}{a^2}}\,\text{si}\right.}{96\sqrt{1-\frac{x^2}{a^2}}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (Sqrt[a^2 - x^2]*(48*x*Sqrt[1 - x^2/a^2]*ArcSin[x/a] + 32*a*ArcSin[x/a]^2 +
 3*Sqrt[2]*a*Sqrt[(-I)*ArcSin[x/a]]*Gamma[1/2, (-2*I)*ArcSin[x/a]] + 3*Sqrt
```

```
[2]*a*Sqrt[I*ArcSin[x/a]]*Gamma[1/2, (2*I)*ArcSin[x/a]]))/(96*Sqrt[1 - x^2/
a^2]*Sqrt[ArcSin[x/a]])
```

Maple [F] time = 0.267, size = 0, normalized size = 0.

$$\int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x)
```

```
[Out] int((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2 - x^2)*sqrt(arcsin(x/a)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-(-a+x)(a+x)}\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(1/2)*asin(x/a)**(1/2),x)
```

```
[Out] Integral(sqrt(-(-a + x)*(a + x))*sqrt(asin(x/a)), x)
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a^2 - x^2)*sqrt(arcsin(x/a)), x)
```

3.457 $\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx$

Optimal. Leaf size=42

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(3/2))/(3*Sqrt[a^2 - x^2])
```

Rubi [A] time = 0.0613725, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcSin[x/a]]/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(3/2))/(3*Sqrt[a^2 - x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx &= \frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{\sqrt{a^2-x^2}}\\ &= \frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}\end{aligned}$$

Mathematica [A] time = 0.0322779, size = 42, normalized size = 1.

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[ArcSin[x/a]]/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(3/2))/(3*Sqrt[a^2 - x^2])
```

Maple [A] time = 0.043, size = 38, normalized size = 0.9

$$\frac{2a}{3}\left(\arcsin\left(\frac{x}{a}\right)\right)^{\frac{3}{2}}\sqrt{\frac{a^2-x^2}{a^2}}\frac{1}{\sqrt{a^2-x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x)
```

```
[Out] 2/3*arcsin(x/a)^(3/2)*a/(a^2-x^2)^(1/2)*((a^2-x^2)/a^2)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(arcsin(x/a))/sqrt(a^2 - x^2), x)
```

Fricas [A] time = 2.279, size = 90, normalized size = 2.14

$$-\frac{2}{3}\sqrt{-\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)}\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/3*sqrt(-arctan(-x/sqrt(a^2 - x^2)))*arctan(-x/sqrt(a^2 - x^2))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\sqrt{-(-a+x)(a+x)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(1/2),x)
```

```
[Out] Integral(sqrt(asin(x/a))/sqrt(-(-a + x)*(a + x)), x)
```

Giac [A] time = 1.22491, size = 20, normalized size = 0.48

$$\frac{2\,|a|\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="giac")
```

```
[Out] 2/3*abs(a)*arcsin(x/a)^(3/2)/a
```

3.458 $\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx$

Optimal. Leaf size=89

$$\frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{a^2\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\text{Unintegrable}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}},x\right)}{2a^3\sqrt{a^2-x^2}}$$

```
[Out] (x*Sqrt[ArcSin[x/a]])/(a^2*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Unintegrab
le[x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(2*a^3*Sqrt[a^2 - x^2])
```

Rubi [A] time = 0.0754712, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2),x]
```

```
[Out] (x*Sqrt[ArcSin[x/a]])/(a^2*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[Int]
[x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(2*a^3*Sqrt[a^2 - x^2])
```

Rubi steps

$$\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx=\frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{a^2\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{2a^3\sqrt{a^2-x^2}}$$

Mathematica [A] time = 0.573014, size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2),x]
```

```
[Out] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2), x]
```

Maple [A] time = 0.227, size = 0, normalized size = 0.

$$\int \sqrt{\arcsin\left(\frac{x}{a}\right)}\left(a^2-x^2\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x)
```

```
[Out] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\left(-\left(-a+x\right)\left(a+x\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(3/2),x)
```

```
[Out] Integral(sqrt(asin(x/a))/(-(-a + x)*(a + x))**(3/2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(3/2), x)
```

3.459 $\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$

Optimal. Leaf size=183

$$-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\text{Unintegrable}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}},x\right)}{6a^5\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\text{Unintegrable}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}},x\right)}{3a^5\sqrt{a^2-x^2}}+\frac{2x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^4\sqrt{a^2-x^2}}+\frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}$$

```
[Out] (x*Sqrt[ArcSin[x/a]])/(3*a^2*(a^2 - x^2)^(3/2)) + (2*x*Sqrt[ArcSin[x/a]])/(
3*a^4*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Unintegrable[x/((1 - x^2/a^2)^2
*Sqrt[ArcSin[x/a]]), x])/(6*a^5*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Unint
egrable[x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(3*a^5*Sqrt[a^2 - x^2])
```

Rubi [A] time = 0.155956, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2),x]
```

```
[Out] (x*Sqrt[ArcSin[x/a]])/(3*a^2*(a^2 - x^2)^(3/2)) + (2*x*Sqrt[ArcSin[x/a]])/(
3*a^4*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[Int][x/((1 - x^2/a^2)^2*S
qrt[ArcSin[x/a]]), x])/(6*a^5*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[I
nt][x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(3*a^5*Sqrt[a^2 - x^2])
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx &= \frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx}{3a^2}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{6a^5\sqrt{a^2-x^2}}\\ &= \frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^4\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{6a^5\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{3a^5\sqrt{a^2-x^2}}\end{aligned}$$

Mathematica [A] time = 1.7583, size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2),x]
```

```
[Out] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2), x]
```

Maple [A] time = 0.273, size = 0, normalized size = 0.

$$\int \sqrt{\arcsin\left(\frac{x}{a}\right)}\left(a^2-x^2\right)^{-\frac{5}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x)
```

```
[Out] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(5/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(5/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2 - x^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(5/2), x)
```

3.460 $\int \left(a^2-x^2\right)^{3/2} \sin^{-1}\left(\frac{x}{a}\right)^{3/2} dx$

Optimal. Leaf size=359

$$-\frac{3\sqrt{\frac{\pi}{2}}a^3\sqrt{a^2-x^2}\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\right)}{512\sqrt{1-\frac{x^2}{a^2}}}-\frac{3\sqrt{\pi}a^3\sqrt{a^2-x^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3a^3\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}}+2$$

```
[Out] (27*a^3*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(256*Sqrt[1 - x^2/a^2]) - (9*a*x
^2*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(32*Sqrt[1 - x^2/a^2]) + (3*(a^2 - x^
2)^(5/2)*Sqrt[ArcSin[x/a]])/(32*a*Sqrt[1 - x^2/a^2]) + (3*a^2*x*Sqrt[a^2 -
x^2]*ArcSin[x/a]^(3/2))/8 + (x*(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2))/4 + (3*
a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(20*Sqrt[1 - x^2/a^2]) - (3*a^3*Sqrt
[Pi/2]*Sqrt[a^2 - x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a]]])/(512*Sqrt[
1 - x^2/a^2]) - (3*a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a
]])/Sqrt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```

Rubi [A] time = 0.421075, antiderivative size = 359, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4649, 4647, 4641, 4629, 4723, 3312, 3304, 3352, 4677, 4661}

$$-\frac{3\sqrt{\frac{\pi}{2}}a^3\sqrt{a^2-x^2}\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\right)}{512\sqrt{1-\frac{x^2}{a^2}}}-\frac{3\sqrt{\pi}a^3\sqrt{a^2-x^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3a^3\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}}+2$$

Antiderivative was successfully verified.

```
[In] Int[(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2),x]
```


```
[Out] (27*a^3*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(256*Sqrt[1 - x^2/a^2]) - (9*a*x
^2*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(32*Sqrt[1 - x^2/a^2]) + (3*(a^2 - x^
2)^(5/2)*Sqrt[ArcSin[x/a]])/(32*a*Sqrt[1 - x^2/a^2]) + (3*a^2*x*Sqrt[a^2 -
x^2]*ArcSin[x/a]^(3/2))/8 + (x*(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2))/4 + (3*
a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(20*Sqrt[1 - x^2/a^2]) - (3*a^3*Sqrt
[Pi/2]*Sqrt[a^2 - x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a]]])/(512*Sqrt[
1 - x^2/a^2]) - (3*a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a
]])/Sqrt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```


Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
```

```
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rubi steps

$$\int \left(a^2-x^2\right)^{3/2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}dx = \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}\left(3a^2\right)\int \sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}dx-\frac{\left(3a\sqrt{a^2-x^2}\right)\int x\Big(}{8\sqrt{}}$$

$$=\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}-$$

$$=-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+$$

$$=-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+$$

$$=-\frac{9a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a$$

$$=\frac{27a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a$$

$$=\frac{27a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a$$

$$=\frac{27a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a$$

Mathematica [C] time = 0.434541, size = 209, normalized size = 0.58

$$\frac{a^3\sqrt{a^2-x^2}\left(-240\sqrt{\pi}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)+\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\left(5\sqrt{i\sin^{-1}\left(\frac{x}{a}\right)}\text{Gamma}\left(\frac{5}{2},-4i\sin^{-1}\left(\frac{x}{a}\right)\right)+5\sqrt{-}\right.\right.}{2560\sqrt{1-}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2),x]
```

```
[Out] (a^3*Sqrt[a^2 - x^2]*(-240*Sqrt[Pi]*Sqrt[ArcSin[x/a]^2]*FresnelC[(2*Sqrt[Ar
cSin[x/a]])/Sqrt[Pi]] + Sqrt[ArcSin[x/a]]*(5*Sqrt[I*ArcSin[x/a]]*Gamma[5/2,
 (-4*I)*ArcSin[x/a]] + 5*Sqrt[(-I)*ArcSin[x/a]]*Gamma[5/2, (4*I)*ArcSin[x/a
]] + 32*Sqrt[ArcSin[x/a]^2]*(12*ArcSin[x/a]^2 + 15*Cos[2*ArcSin[x/a]] + 20*
ArcSin[x/a]*Sin[2*ArcSin[x/a]]))))/(2560*Sqrt[1 - x^2/a^2]*Sqrt[ArcSin[x/a]
^2])
```

Maple [F] time = 0.184, size = 0, normalized size = 0.

$$\int \left(a^2-x^2\right)^{\frac{3}{2}} \left(\arcsin\left(\frac{x}{a}\right)\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x)
```

```
[Out] int((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a^2-x^2\right)^{\frac{3}{2}} \arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((a^2 - x^2)^(3/2)*arcsin(x/a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(3/2)*asin(x/a)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a^2-x^2\right)^{\frac{3}{2}} \arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a^2 - x^2)^(3/2)*arcsin(x/a)^(3/2), x)
```

3.461 $\int \sqrt{a^2-x^2} \sin^{-1}\left(\frac{x}{a}\right)^{3/2} dx$

Optimal. Leaf size=215

$$-\frac{3\sqrt{\pi}a\sqrt{a^2-x^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+$$

```
[Out] (3*a*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(16*Sqrt[1 - x^2/a^2]) - (3*x^2*Sqr
t[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(8*a*Sqrt[1 - x^2/a^2]) + (x*Sqrt[a^2 - x^2
]*ArcSin[x/a]^(3/2))/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[1 -
x^2/a^2]) - (3*a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a]])/Sq
rt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```

Rubi [A] time = 0.231775, antiderivative size = 215, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4647, 4641, 4629, 4723, 3312, 3304, 3352}

$$-\frac{3\sqrt{\pi}a\sqrt{a^2-x^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2),x]
```


```
[Out] (3*a*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(16*Sqrt[1 - x^2/a^2]) - (3*x^2*Sqr
t[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(8*a*Sqrt[1 - x^2/a^2]) + (x*Sqrt[a^2 - x^2
]*ArcSin[x/a]^(3/2))/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[1 -
x^2/a^2]) - (3*a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a]])/Sq
rt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```


Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}dx = \frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{\sqrt{a^2-x^2}\int\frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{1-\frac{x^2}{a^2}}}dx}{2\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(3\sqrt{a^2-x^2}\right)\int x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}dx}{4a\sqrt{1-\frac{x^2}{a^2}}}$$

$$= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{\left(3\sqrt{a\right.}}{}$$

$$= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{\left(3a\sqrt{\right.}}{}$$

$$= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{\left(3a\sqrt{\right.}}{}$$

$$= \frac{3a\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-}}{}$$

$$= \frac{3a\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-}}{}$$

$$= \frac{3a\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-}}{}$$

Mathematica [C] time = 0.13617, size = 173, normalized size = 0.8

$$\frac{\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\left(15\sqrt{2}a\sqrt{i\sin^{-1}\left(\frac{x}{a}\right)}\text{Gamma}\left(\frac{3}{2},-2i\sin^{-1}\left(\frac{x}{a}\right)\right)+15\sqrt{2}a\sqrt{-i\sin^{-1}\left(\frac{x}{a}\right)}\text{Gamma}\left(\frac{3}{2},2i\sin^{-1}\left(\frac{x}{a}\right)\right)+3\right.}{320\sqrt{1-\frac{x^2}{a^2}}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2),x]
```

```
[Out] (Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]]*(32*ArcSin[x/a]*Sqrt[ArcSin[x/a]^2]*(5*x
*Sqrt[1 - x^2/a^2] + 2*a*ArcSin[x/a]) + 15*Sqrt[2]*a*Sqrt[I*ArcSin[x/a]]*Ga
mma[3/2, (-2*I)*ArcSin[x/a]] + 15*Sqrt[2]*a*Sqrt[(-I)*ArcSin[x/a]]*Gamma[3/
2, (2*I)*ArcSin[x/a]]))/(320*Sqrt[1 - x^2/a^2]*Sqrt[ArcSin[x/a]^2])
```

Maple [F] time = 0.236, size = 0, normalized size = 0.

$$\int \sqrt{a^2-x^2}\left(\arcsin\left(\frac{x}{a}\right)\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x)
```

```
[Out] int((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2 - x^2)*arcsin(x/a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(1/2)*asin(x/a)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a^2 - x^2} \arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a^2 - x^2)*arcsin(x/a)^(3/2), x)
```

3.462 $\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}} dx$

Optimal. Leaf size=42

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[a^2 - x^2])
```

Rubi [A] time = 0.0646827, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[x/a]^(3/2)/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[a^2 - x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx &= \frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{\sqrt{a^2-x^2}}\\ &= \frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}\end{aligned}$$

Mathematica [A] time = 0.0359322, size = 42, normalized size = 1.

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[x/a]^(3/2)/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[a^2 - x^2])
```

Maple [A] time = 0.038, size = 38, normalized size = 0.9

$$\frac{2a}{5}\left(\arcsin\left(\frac{x}{a}\right)\right)^{\frac{5}{2}}\sqrt{\frac{a^2-x^2}{a^2}}\frac{1}{\sqrt{a^2-x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x)
```

```
[Out] 2/5*arcsin(x/a)^(5/2)*a/(a^2-x^2)^(1/2)*((a^2-x^2)/a^2)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{\sqrt{a^2-x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(x/a)^(3/2)/sqrt(a^2 - x^2), x)
```

Fricas [A] time = 2.30532, size = 92, normalized size = 2.19

$$\frac{2}{5}\sqrt{-\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)}\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="fricas")
```

```
[Out] 2/5*sqrt(-arctan(-x/sqrt(a^2 - x^2)))*arctan(-x/sqrt(a^2 - x^2))^2
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^{\frac{3}{2}}\left(\frac{x}{a}\right)}{\sqrt{-\left(-a+x\right)\left(a+x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(3/2)/(a**2-x**2)**(1/2),x)
```

```
[Out] Integral(asin(x/a)**(3/2)/sqrt(-(-a + x)*(a + x)), x)
```

Giac [A] time = 1.40683, size = 16, normalized size = 0.38

$$\frac{2}{5} \arcsin\left(\frac{x}{a}\right)^{\frac{5}{2}} \operatorname{sgn}(a)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="giac")
```

```
[Out] 2/5*arcsin(x/a)^(5/2)*sgn(a)
```

3.463 $\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$

Optimal. Leaf size=89

$$\frac{x\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{a^2\sqrt{a^2-x^2}}-\frac{3\sqrt{1-\frac{x^2}{a^2}}\text{Unintegrable}\left(\frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{1-\frac{x^2}{a^2}},x\right)}{2a^3\sqrt{a^2-x^2}}$$

```
[Out] (x*ArcSin[x/a]^(3/2))/(a^2*Sqrt[a^2 - x^2]) - (3*Sqrt[1 - x^2/a^2]*Unintegr
able[(x*Sqrt[ArcSin[x/a]])/(1 - x^2/a^2), x])/(2*a^3*Sqrt[a^2 - x^2])
```

Rubi [A] time = 0.0749571, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[x/a]^(3/2))/(a^2*Sqrt[a^2 - x^2]) - (3*Sqrt[1 - x^2/a^2]*Defer[In
t][(x*Sqrt[ArcSin[x/a]])/(1 - x^2/a^2), x])/(2*a^3*Sqrt[a^2 - x^2])
```

Rubi steps

$$\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx=\frac{x\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{a^2\sqrt{a^2-x^2}}-\frac{\left(3\sqrt{1-\frac{x^2}{a^2}}\right)\int\frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{1-\frac{x^2}{a^2}}\,dx}{2a^3\sqrt{a^2-x^2}}$$

Mathematica [A] time = 0.657982, size = 0, normalized size = 0.

$$\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2),x]
```

```
[Out] Integrate[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2), x]
```

Maple [A] time = 0.188, size = 0, normalized size = 0.

$$\int \left(\arcsin\left(\frac{x}{a}\right)\right)^{\frac{3}{2}}\left(a^2-x^2\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x)
```

```
[Out] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{\left(a^2 - x^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(x/a)^(3/2)/(a^2 - x^2)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(3/2)/(a**2-x**2)**(3/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{\left(a^2 - x^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(x/a)^(3/2)/(a^2 - x^2)^(3/2), x)
```

3.464 $\int \frac{x}{\sqrt{1-x^2}\sqrt{\sin^{-1}(x)}}\,dx$

Optimal. Leaf size=25

$$\sqrt{2\pi}S\left(\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(x)}\right)$$

```
[Out] Sqrt[2*Pi]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcSin[x]]]
```

Rubi [A] time = 0.0607728, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4723, 3305, 3351}

$$\sqrt{2\pi}S\left(\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(x)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - x^2]*Sqrt[ArcSin[x]]),x]
```

```
[Out] Sqrt[2*Pi]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcSin[x]]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{\sqrt{1-x^2}\sqrt{\sin^{-1}(x)}}\,dx &= \text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(x)\right)\\ &= 2\,\text{Subst}\left(\int \sin\left(x^2\right)\,dx, x, \sqrt{\sin^{-1}(x)}\right)\\ &= \sqrt{2\pi}S\left(\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(x)}\right)\end{aligned}$$

Mathematica [C] time = 0.0762037, size = 53, normalized size = 2.12

$$-\frac{\sqrt{-i\sin^{-1}(x)}\text{Gamma}\left(\frac{1}{2},-i\sin^{-1}(x)\right)+\sqrt{i\sin^{-1}(x)}\text{Gamma}\left(\frac{1}{2},i\sin^{-1}(x)\right)}{2\sqrt{\sin^{-1}(x)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/(Sqrt[1 - x^2]*Sqrt[ArcSin[x]]),x]
```

```
[Out] -(Sqrt[(-I)*ArcSin[x]]*Gamma[1/2, (-I)*ArcSin[x]] + Sqrt[I*ArcSin[x]]*Gamma
[1/2, I*ArcSin[x]])/(2*Sqrt[ArcSin[x]])
```

Maple [A] time = 0.067, size = 20, normalized size = 0.8

$$\text{FresnelS}\left(\frac{\sqrt{2}}{\sqrt{\pi}}\sqrt{\arcsin(x)}\right)\sqrt{2}\sqrt{\pi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x)
```

```
[Out] FresnelS(2^(1/2)/Pi^(1/2)*arcsin(x)^(1/2))*2^(1/2)*Pi^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x}{\sqrt{-(x-1)(x+1)}\sqrt{\operatorname{asin}(x)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x**2+1)**(1/2)/asin(x)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(-(x - 1)*(x + 1))*sqrt(asin(x))), x)
```

Giac [C] time = 1.35562, size = 50, normalized size = 2.

$$\left(\frac{1}{4}i-\frac{1}{4}\right)\sqrt{2}\sqrt{\pi}\operatorname{erf}\left(\left(\frac{1}{2}i-\frac{1}{2}\right)\sqrt{2}\sqrt{\arcsin(x)}\right)-\left(\frac{1}{4}i+\frac{1}{4}\right)\sqrt{2}\sqrt{\pi}\operatorname{erf}\left(-\left(\frac{1}{2}i+\frac{1}{2}\right)\sqrt{2}\sqrt{\arcsin(x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="giac")
```

```
[Out] (1/4*I - 1/4)*sqrt(2)*sqrt(pi)*erf((1/2*I - 1/2)*sqrt(2)*sqrt(arcsin(x))) -
 (1/4*I + 1/4)*sqrt(2)*sqrt(pi)*erf(-(1/2*I + 1/2)*sqrt(2)*sqrt(arcsin(x)))
```

3.465 $\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\sin^{-1}(ax)}}\,dx$

Optimal. Leaf size=244

$$\frac{3\sqrt{\frac{\pi}{2}}c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{16a\sqrt{1-a^2x^2}}+\frac{\sqrt{\frac{\pi}{3}}c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{32a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}c^2\sqrt{c-a^2cx^2}\,\text{F}}{32a\sqrt{1}}$$

```
[Out] (5*c^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*a*Sqrt[1 - a^2*x^2]) + (3*
c^2*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]]
)/(16*a*Sqrt[1 - a^2*x^2]) + (c^2*Sqrt[Pi/3]*Sqrt[c - a^2*c*x^2]*FresnelC[2
*Sqrt[3/Pi]*Sqrt[ArcSin[a*x]]])/(32*a*Sqrt[1 - a^2*x^2]) + (15*c^2*Sqrt[Pi]
*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1
 - a^2*x^2])
```

Rubi [A] time = 0.193342, antiderivative size = 244, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4663, 4661, 3312, 3304, 3352}

$$\frac{3\sqrt{\frac{\pi}{2}}c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{16a\sqrt{1-a^2x^2}}+\frac{\sqrt{\frac{\pi}{3}}c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{32a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}c^2\sqrt{c-a^2cx^2}\,\text{F}}{32a\sqrt{1}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(5/2)/Sqrt[ArcSin[a*x]],x]
```


```
[Out] (5*c^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*a*Sqrt[1 - a^2*x^2]) + (3*
c^2*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]]
)/(16*a*Sqrt[1 - a^2*x^2]) + (c^2*Sqrt[Pi/3]*Sqrt[c - a^2*c*x^2]*FresnelC[2
*Sqrt[3/Pi]*Sqrt[ArcSin[a*x]]])/(32*a*Sqrt[1 - a^2*x^2]) + (15*c^2*Sqrt[Pi]
*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1
 - a^2*x^2])
```


Rule 4663

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(d^(p - 1/2)*Sqrt[d + e*x^2])/Sqrt[1 - c^2*x^2], Int[(1 -
c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IGtQ[2*p, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{\left(c-a^2cx^2\right)^{5/2}}{\sqrt{\sin^{-1}(ax)}}\,dx = \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\int \frac{\left(1-a^2x^2\right)^{5/2}}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \frac{\cos^6(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \left(\frac{5}{16\sqrt{x}}+\frac{15\cos(2x)}{32\sqrt{x}}+\frac{3\cos(4x)}{16\sqrt{x}}+\frac{\cos(6x)}{32\sqrt{x}}\right)dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8a\sqrt{1-a^2x^2}} + \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \frac{\cos(6x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{32a\sqrt{1-a^2x^2}} + \frac{\left(3c^2\sqrt{c-a^2c\right.}{}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8a\sqrt{1-a^2x^2}} + \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \cos\left(6x^2\right)dx, x, \sqrt{\sin^{-1}(ax)}\right)}{16a\sqrt{1-a^2x^2}} + \frac{\left(3c^2\sqrt{c\right.}{}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8a\sqrt{1-a^2x^2}} + \frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{16a\sqrt{1-a^2x^2}} + \frac{c^2\sqrt{\frac{\pi}{3}}\sqrt{c-a^2cx^2}C\left(2\right.}{32a\sqrt{1-a}}$$

Mathematica [C] time = 0.629185, size = 336, normalized size = 1.38

$$\frac{c^2\sqrt{c-a^2cx^2}\left(-45i\sqrt{2}\left(-i\sin^{-1}(ax)\right)^{3/2}\mathrm{Gamma}\left(\frac{1}{2},2i\sin^{-1}(ax)\right)-18i\left(-i\sin^{-1}(ax)\right)^{3/2}\mathrm{Gamma}\left(\frac{1}{2},4i\sin^{-1}(ax)\right)-\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c^2*Sqrt[c - a^2*c*x^2]*(240*ArcSin[a*x]*Sqrt[ArcSin[a*x]^2] + (3*I)*Sqrt[
2]*(16*(I*ArcSin[a*x])^(3/2) + Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2])*
Gamma[1/2, (-2*I)*ArcSin[a*x]] - (45*I)*Sqrt[2]*((-I)*ArcSin[a*x])^(3/2)*Ga
mma[1/2, (2*I)*ArcSin[a*x]] + (24*I)*(I*ArcSin[a*x])^(3/2)*Gamma[1/2, (-4*I
)*ArcSin[a*x]] + (6*I)*Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2]*Gamma[1/2
, (-4*I)*ArcSin[a*x]] - (18*I)*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (4*I)*Ar
cSin[a*x]] - I*Sqrt[6]*Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2]*Gamma[1/2
, (-6*I)*ArcSin[a*x]] - I*Sqrt[6]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (6*I)
*ArcSin[a*x]]))/(384*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]]*Sqrt[ArcSin[a*x]
^2])
```

Maple [F] time = 0.182, size = 0, normalized size = 0.

$$\int \left(-a^2 c x^2+c\right)^{\frac{5}{2}} \frac{1}{\sqrt{\arcsin \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(5/2)/asin(a*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-a^2 c x^2+c\right)^{\frac{5}{2}}}{\sqrt{\arcsin \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="giac")

[Out] integrate((-a^2*c*x^2 + c)^(5/2)/sqrt(arcsin(a*x)), x)
```

3.466 $\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\sin^{-1}(ax)}}\,dx$

Optimal. Leaf size=170

$$\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{8a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}c\sqrt{c-a^2cx^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}+\frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}}$$

```
[Out] (3*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(4*a*Sqrt[1 - a^2*x^2]) + (c*Sq
rt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(8*a
*Sqrt[1 - a^2*x^2]) + (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcS
in[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.154473, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4663, 4661, 3312, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{8a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}c\sqrt{c-a^2cx^2}\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}+\frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)/Sqrt[ArcSin[a*x]],x]
```


```
[Out] (3*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(4*a*Sqrt[1 - a^2*x^2]) + (c*Sq
rt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(8*a
*Sqrt[1 - a^2*x^2]) + (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcS
in[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 - a^2*x^2])
```


Rule 4663

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(d^(p - 1/2)*Sqrt[d + e*x^2])/Sqrt[1 - c^2*x^2], Int[(1 -
c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IGtQ[2*p, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
```

```
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(c-a^2cx^2\right)^{3/2}}{\sqrt{\sin^{-1}(ax)}}\,dx &= \frac{\left(c\sqrt{c-a^2cx^2}\right)\int \frac{\left(1-a^2x^2\right)^{3/2}}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}\\
&= \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{x}}\,dx,x,\sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx,x,\sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}}+\frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx,x,\sin^{-1}(ax)\right)}{8a\sqrt{1-a^2x^2}}+\frac{\left(c\sqrt{c-a^2cx^2}\right)\text{S}
\\
&= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}}+\frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \cos\left(4x^2\right)dx,x,\sqrt{\sin^{-1}(ax)}\right)}{4a\sqrt{1-a^2x^2}}+\frac{\left(c\sqrt{c-a^2\right.}
\\
&= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}}+\frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{8a\sqrt{1-a^2x^2}}+\frac{c\sqrt{\pi}\sqrt{c-a^2cx^2}C\left(\frac{2\sqrt{\sin^{-1}(}}{\sqrt{\pi}}\right.}{2a\sqrt{1-a^2x^2}}
\end{aligned}$$

Mathematica [C] time = 0.305299, size = 182, normalized size = 1.07

$$\frac{c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}\left(-4\sqrt{2}\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{1}{2},-2i\sin^{-1}(ax)\right)-4\sqrt{2}\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{1}{2},2i\sin^{-1}(ax)\right)}{32a\sqrt{1-a^2x^2}\sqrt{\sin}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]*(24*Sqrt[ArcSin[a*x]^2] - 4*Sqrt[2
]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] - 4*Sqrt[2]*Sqrt[(-I)*
ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[a*x]] - Sqrt[I*ArcSin[a*x]]*Gamma[1/2,
 (-4*I)*ArcSin[a*x]] - Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (4*I)*ArcSin[a*x]]
))/(32*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]^2])
```

Maple [F] time = 0.181, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{\frac{3}{2}}\frac{1}{\sqrt{\arcsin(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}}{\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(1/2),x)
```

```
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/sqrt(asin(a*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-a^{2}cx^{2}+c\right)^{\frac{3}{2}}}{\sqrt{\arcsin\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/sqrt(arcsin(a*x)), x)
```

3.467 $\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\sin^{-1}(ax)}}\,dx$

Optimal. Leaf size=99

$$\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}$$

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[1 - a^2*x^2]) + (Sqrt[Pi]*S
qrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 -
a^2*x^2])
```

Rubi [A] time = 0.121941, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4663, 4661, 3312, 3304, 3352}

$$\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[1 - a^2*x^2]) + (Sqrt[Pi]*S
qrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 -
a^2*x^2])
```

Rule 4663

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(d^(p - 1/2)*Sqrt[d + e*x^2])/Sqrt[1 - c^2*x^2], Int[(1 -
c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IGtQ[2*p, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\sin^{-1}(ax)}}\,dx &= \frac{\sqrt{c-a^2cx^2}\int \frac{\sqrt{1-a^2x^2}}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}\right)dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{2a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \cos\left(2x^2\right)dx, x, \sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,C\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}
\end{aligned}
$$

Mathematica [C] time = 0.128655, size = 118, normalized size = 1.19

$$
\frac{\sqrt{c\left(1-a^2x^2\right)}\left(-i\sqrt{2}\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{1}{2},-2i\sin^{-1}(ax)\right)+i\sqrt{2}\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{1}{2},2i\sin^{-1}(ax)\right)+8\sin^{-1}(ax\right.}{8a\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}
$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (Sqrt[c*(1 - a^2*x^2)]*(8*ArcSin[a*x] - I*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Ga
mma[1/2, (-2*I)*ArcSin[a*x]] + I*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*
I)*ArcSin[a*x]]))/(8*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F] time = 0.235, size = 0, normalized size = 0.

$$
\int \sqrt{-a^2cx^2+c}\frac{1}{\sqrt{\arcsin(ax)}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c\,(ax-1)\,(ax+1)}}{\sqrt{\operatorname{asin}\,(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(1/2),x)
```

```
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/sqrt(asin(a*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-a^2cx^2+c}}{\sqrt{\arcsin\,(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)/sqrt(arcsin(a*x)), x)
```

3.468 $\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}\,dx$

Optimal. Leaf size=42

$$\frac{2\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{c-a^2cx^2}}$$

```
[Out] (2*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0699013, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$\frac{2\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[c - a^2*c*x^2])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{1}{\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{2\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.0465423, size = 42, normalized size = 1.

$$\frac{2\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[c - a^2*c*x^2])
```

Maple [A] time = 0.034, size = 38, normalized size = 0.9

$$2\,{\frac{\sqrt{\arcsin\left(ax\right)}\sqrt{-a^{2}x^{2}+1}}{a\sqrt{-c\left(a^{2}x^{2}-1\right)}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] 2*arcsin(a*x)^(1/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{-c\left(ax-1\right)\left(ax+1\right)}\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*sqrt(asin(a*x))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a^2cx^2+c}\sqrt{\arcsin{(ax)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*sqrt(arcsin(a*x))), x)
```

3.469 $\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{1}{\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]), x]
```

Rubi [A] time = 0.0405698, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] Defer[Int][1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}\,dx=\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.851941, size = 0, normalized size = 0.

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]), x]
```

Maple [A] time = 0.207, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{-\frac{3}{2}}\frac{1}{\sqrt{\arcsin(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")

[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(1/2),x)

[Out] Integral(1/((-c*(a*x - 1)*(a*x + 1))**(3/2)*sqrt(asin(a*x))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^{2}cx^{2}+c\right)^{\frac{3}{2}}\sqrt{\arcsin\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="giac")

[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*sqrt(arcsin(a*x))), x)
```

3.470 $\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]), x]
```

Rubi [A] time = 0.0403315, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] Defer[Int][1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}\,dx=\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Mathematica [A] time = 2.03573, size = 0, normalized size = 0.

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]), x]
```

Maple [A] time = 0.284, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{-\frac{5}{2}}\frac{1}{\sqrt{\arcsin(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^2cx^2+c\right)^{\frac{5}{2}}\sqrt{\arcsin\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*sqrt(arcsin(a*x))), x)
```

3.471 $\int \frac{(c-a^2cx^2)^{5/2}}{\sin^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=237

$$-\frac{3\sqrt{\frac{\pi}{2}}c^2\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{2a\sqrt{1-a^2x^2}}-\frac{\sqrt{3\pi}c^2\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{3}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{8a\sqrt{1-a^2x^2}}-\frac{15\sqrt{\pi}c^2\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(5/2))/(a*Sqrt[ArcSin[a*x]]) - (3*c^2
*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(
2*a*Sqrt[1 - a^2*x^2]) - (c^2*Sqrt[3*Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqr
t[3/Pi]*Sqrt[ArcSin[a*x]]])/(8*a*Sqrt[1 - a^2*x^2]) - (15*c^2*Sqrt[Pi]*Sqrt
[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2
*x^2])
```

Rubi [A] time = 0.186019, antiderivative size = 237, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4659, 4723, 4406, 3305, 3351}

$$-\frac{3\sqrt{\frac{\pi}{2}}c^2\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{2a\sqrt{1-a^2x^2}}-\frac{\sqrt{3\pi}c^2\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{3}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{8a\sqrt{1-a^2x^2}}-\frac{15\sqrt{\pi}c^2\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(5/2)/ArcSin[a*x]^(3/2),x]
```


```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(5/2))/(a*Sqrt[ArcSin[a*x]]) - (3*c^2
*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(
2*a*Sqrt[1 - a^2*x^2]) - (c^2*Sqrt[3*Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqr
t[3/Pi]*Sqrt[ArcSin[a*x]]])/(8*a*Sqrt[1 - a^2*x^2]) - (15*c^2*Sqrt[Pi]*Sqrt
[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2
*x^2])
```


Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{\left(c-a^2cx^2\right)^{5/2}}{\sin^{-1}(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(12ac^2\sqrt{c-a^2cx^2}\right)\int \frac{x\left(1-a^2x^2\right)^2}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(12c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^5(x)\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(12c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{5\sin(2x)}{32\sqrt{x}} + \frac{\sin(4x)}{8\sqrt{x}} + \frac{\sin(6x)}{32\sqrt{x}}\right) dx, x, \sin^{-1}(\right.}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(6x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{8a\sqrt{1-a^2x^2}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right.}{}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(6x^2\right)dx, x, \sqrt{\sin^{-1}(ax)}\right)}{4a\sqrt{1-a^2x^2}} - \frac{\left(3c^2\sqrt{c-\right.}{}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{2a\sqrt{1-a^2x^2}} - \frac{c^2\sqrt{3\pi}\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{3}{\pi}}\right.}{8a\sqrt{1-a^2x^2}}$$

Mathematica [C] time = 1.05562, size = 404, normalized size = 1.7

$$-\frac{c^2\sqrt{c-a^2cx^2}e^{-6i\sin^{-1}(ax)}\left(\sqrt{2}e^{6i\sin^{-1}(ax)}\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{1}{2},-2i\sin^{-1}(ax)\right)+\sqrt{2}e^{6i\sin^{-1}(ax)}\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] -(c^2*Sqrt[c - a^2*c*x^2]*(1 + 6*E^((2*I)*ArcSin[a*x]) + 15*E^((4*I)*ArcSin
[a*x]) + 20*E^((6*I)*ArcSin[a*x]) + 15*E^((8*I)*ArcSin[a*x]) + 6*E^((10*I)*
ArcSin[a*x]) + E^((12*I)*ArcSin[a*x]) + 64*E^((6*I)*ArcSin[a*x])*Sqrt[Pi]*S
```

```
qrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]] + Sqrt[2]*E^((6*I
)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] + Sqrt
[2]*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[a*x]]
 - 12*E^((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-4*I)*ArcSin
[a*x]] - 12*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (4*I)*ArcS
in[a*x]] - Sqrt[6]*E^((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2,
(-6*I)*ArcSin[a*x]] - Sqrt[6]*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gam
ma[1/2, (6*I)*ArcSin[a*x]]))/(32*a*E^((6*I)*ArcSin[a*x])*Sqrt[1 - a^2*x^2]*
Sqrt[ArcSin[a*x]])
```

Maple [F] time = 0.178, size = 0, normalized size = 0.

$$\int \left(-a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \left(\arcsin \left(a x \right)\right)^{-\frac{3}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(5/2)/asin(a*x)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-a^2cx^2+c)^{\frac{5}{2}}}{\arcsin{(ax)}^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(5/2)/arcsin(a*x)^(3/2), x)
```

3.472 $\int \frac{\left(c-a^2cx^2\right)^{3/2}}{\sin^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=163

$$-\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{\pi}c\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(a*Sqrt[ArcSin[a*x]]) - (c*Sqr
t[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(a*Sq
rt[1 - a^2*x^2]) - (2*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSi
n[a*x]])/Sqrt[Pi]])/(a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.133859, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4659, 4723, 4406, 3305, 3351}

$$-\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{\pi}c\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(3/2),x]
```


```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(a*Sqrt[ArcSin[a*x]]) - (c*Sqr
t[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(a*Sq
rt[1 - a^2*x^2]) - (2*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSi
n[a*x]])/Sqrt[Pi]])/(a*Sqrt[1 - a^2*x^2])
```


Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{\left(c-a^2cx^2\right)^{3/2}}{\sin^{-1}(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(8ac\sqrt{c-a^2cx^2}\right)\int \frac{x\left(1-a^2x^2\right)}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{\sin(2x)}{4\sqrt{x}}+\frac{\sin(4x)}{8\sqrt{x}}\right)dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}} - \frac{\left(2c\sqrt{c-a^2cx^2}\right)\text{S}}{}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(2c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(4x^2\right)dx, x, \sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}} - \frac{\left(4c\sqrt{c-a}\right.}{}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}} - \frac{2c\sqrt{\pi}\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\sin^{-1}(a}}{\sqrt{\pi}}\right.}{a\sqrt{1-a^2x^2}}$$

Mathematica [C] time = 0.376242, size = 211, normalized size = 1.29

$$-\frac{c\sqrt{c-a^2cx^2}e^{-4i\sin^{-1}(ax)}\left(-2e^{4i\sin^{-1}(ax)}\sqrt{-i\sin^{-1}(ax)}\text{Gamma}\left(\frac{1}{2},-4i\sin^{-1}(ax)\right)-2e^{4i\sin^{-1}(ax)}\sqrt{i\sin^{-1}(ax)}\text{Gamma}\left(\frac{1}{2},4\right.\right.}{8a\sqrt{1-a^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] -(c*Sqrt[c - a^2*c*x^2]*(1 + 6*E^((4*I)*ArcSin[a*x]) + E^((8*I)*ArcSin[a*x]
) + 8*E^((4*I)*ArcSin[a*x])*Cos[2*ArcSin[a*x]] + 16*E^((4*I)*ArcSin[a*x])*S
qrt[Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]] - 2*E^((
4*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-4*I)*ArcSin[a*x]] - 2
*E^((4*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (4*I)*ArcSin[a*x]]))/
```

```
(8*a*E^((4*I)*ArcSin[a*x])*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F] time = 0.177, size = 0, normalized size = 0.

$$\int \left(-a^{2} c x^{2}+c\right)^{\frac{3}{2}} \left(\arcsin \left(a x\right)\right)^{-\frac{3}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(- c \left(a x - 1\right) \left(a x + 1\right)\right)^{\frac{3}{2}}}{\operatorname{asin}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(3/2),x)
```

```
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/asin(a*x)**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-a^{2} c x^{2}+c\right)^{\frac{3}{2}}}{\arcsin \left(a x\right)^{\frac{3}{2}}}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/arcsin(a*x)^(3/2), x)
```

3.473 $\int \frac{\sqrt{c-a^2cx^2}}{\sin^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=98

$$-\frac{2\sqrt{\pi}\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(a*Sqrt[ArcSin[a*x]]) - (2*Sqrt[
Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(a*Sqrt[1
 - a^2*x^2])
```

Rubi [A] time = 0.0799091, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4659, 4635, 4406, 12, 3305, 3351}

$$-\frac{2\sqrt{\pi}\sqrt{c-a^2cx^2}S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(3/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(a*Sqrt[ArcSin[a*x]]) - (2*Sqrt[
Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(a*Sqrt[1
 - a^2*x^2])
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sqrt{c-a^2cx^2}}{\sin^{-1}(ax)^{3/2}}\,dx &= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4a\sqrt{c-a^2cx^2}\right)\int \frac{x}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{2\sqrt{\pi}\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}
\end{aligned}
$$

Mathematica [A] time = 0.170107, size = 83, normalized size = 0.85

$$
-\frac{\sqrt{c\left(1-a^2x^2\right)}\left(2\sqrt{\pi}\sqrt{\sin^{-1}(ax)}\,S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)+\cos\left(2\sin^{-1}(ax)\right)+1\right)}{a\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(3/2),x]
```

```
[Out] -((Sqrt[c*(1 - a^2*x^2)]*(1 + Cos[2*ArcSin[a*x]] + 2*Sqrt[Pi]*Sqrt[ArcSin[a
*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]]))/(a*Sqrt[1 - a^2*x^2]*Sqrt[A
rcSin[a*x]]))
```

Maple [F] time = 0.234, size = 0, normalized size = 0.

$$\int \sqrt{-a^{2}c x^{2}+c}\, (\arcsin (a x))^{-\frac{3}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c\, (a x-1)\, (a x+1)}}{\operatorname{asin}^{\frac{3}{2}}{(a x)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(3/2),x)
```

```
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/asin(a*x)**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-a^{2}c x^{2}+c}}{\arcsin (a x)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)/arcsin(a*x)^(3/2), x)
```

3.474 $\int \frac{1}{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=42

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])
```

Rubi [A] time = 0.0695152, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{1}{\sqrt{1-a^2x^2}\sin^{-1}(ax)^{3/2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= -\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}\end{aligned}$$

Mathematica [A] time = 0.0440858, size = 42, normalized size = 1.

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [A] time = 0.036, size = 38, normalized size = 0.9

$$-2\frac{\sqrt{-a^2x^2+1}}{\sqrt{\arcsin(ax)}a\sqrt{-c(a^2x^2-1)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] -2/arcsin(a*x)^(1/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 2.15171, size = 109, normalized size = 2.6

$$\frac{2\sqrt{-a^2cx^2+c}\sqrt{-a^2x^2+1}}{(a^3cx^2-ac)\sqrt{\arcsin(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] 2*sqrt(-a^2*c*x^2 + c)*sqrt(-a^2*x^2 + 1)/((a^3*c*x^2 - a*c)*sqrt(arcsin(a*
x)))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{-c(ax-1)(ax+1)}\operatorname{asin}^{\frac{3}{2}}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(3/2),x)
```

```
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a^2cx^2 + c}\arcsin(ax)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(3/2)), x)
```

3.475 $\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=102

$$\frac{4a\sqrt{1-a^2x^2}\,\text{Unintegrable}\left(\frac{x}{\left(1-a^2x^2\right)^2\sqrt{\sin^{-1}(ax)}},x\right)}{c\sqrt{c-a^2cx^2}}-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]) + (4*a*S
qrt[1 - a^2*x^2]*Unintegrable[x/((1 - a^2*x^2)^2*Sqrt[ArcSin[a*x]]), x])/(c
*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0917123, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]) + (4*a*S
qrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^2*Sqrt[ArcSin[a*x]]), x])/(c*S
qrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}+\frac{\left(4a\sqrt{1-a^2x^2}\right)\int \frac{x}{\left(1-a^2x^2\right)^2\sqrt{\sin^{-1}(ax)}}\,dx}{c\sqrt{c-a^2cx^2}}$$

Mathematica [A] time = 0.840648, size = 0, normalized size = 0.

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)), x]
```

Maple [A] time = 0.211, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{-\frac{3}{2}}\left(\arcsin(ax)\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(3/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}\arcsin\left(ax\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(3/2)), x)
```

3.476 $\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=102

$$\frac{8a\sqrt{1-a^2x^2}\,\text{Unintegrable}\left(\frac{x}{\left(1-a^2x^2\right)^3\sqrt{\sin^{-1}(ax)}},x\right)}{c^2\sqrt{c-a^2cx^2}}-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]) + (8*a*S
qrt[1 - a^2*x^2]*Unintegrable[x/((1 - a^2*x^2)^3*Sqrt[ArcSin[a*x]]), x])/(c
^2*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0938901, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]) + (8*a*S
qrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^3*Sqrt[ArcSin[a*x]]), x])/(c^2
*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^{3/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}+\frac{\left(8a\sqrt{1-a^2x^2}\right)\int \frac{x}{\left(1-a^2x^2\right)^3\sqrt{\sin^{-1}(ax)}}\,dx}{c^2\sqrt{c-a^2cx^2}}$$

Mathematica [A] time = 1.87848, size = 0, normalized size = 0.

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)), x]
```

Maple [A] time = 0.291, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{-\frac{5}{2}}\left(\arcsin(ax)\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(3/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^2cx^2 + c\right)^{\frac{5}{2}} \arcsin\left(ax\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^(3/2)), x)
```

3.477 $\int \frac{(c-a^2cx^2)^{3/2}}{\sin^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=206

$$-\frac{4\sqrt{2\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{3a\sqrt{1-a^2x^2}}-\frac{8\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(3*a*ArcSin[a*x]^(3/2)) + (16*
c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (4*c*Sqrt[2*
Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(3*a*Sqrt
[1 - a^2*x^2]) - (8*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[
a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.29656, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4659, 4721, 4661, 3312, 3304, 3352, 4723, 4406}

$$-\frac{4\sqrt{2\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{3a\sqrt{1-a^2x^2}}-\frac{8\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(5/2),x]
```


```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(3*a*ArcSin[a*x]^(3/2)) + (16*
c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (4*c*Sqrt[2*
Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(3*a*Sqrt
[1 - a^2*x^2]) - (8*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[
a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```


Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p
*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + (-Dist[(f*m*d^IntPart[p]*
(d + e*x^2)^FracPart[p])/(b*c*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist
[(c*(m + 2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(b*f*(n + 1)*(1 - c
^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcS
in[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e,
 0] && LtQ[n, -1] && IGtQ[m, -3] && IGtQ[2*p, 0]
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{\left(c-a^2cx^2\right)^{3/2}}{\sin^{-1}(ax)^{5/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} - \frac{\left(8ac\sqrt{c-a^2cx^2}\right)\int \frac{x\left(1-a^2x^2\right)}{\sin^{-1}(ax)^{3/2}}dx}{3\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\int \frac{\sqrt{1-a^2x^2}}{\sqrt{\sin^{-1}(ax)}}dx}{3\sqrt{1-a^2x^2}} + \frac{(64}{}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}dx, x\right.}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}} + \frac{\cos}{2\sqrt{}}\right.\right.}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}dx, x,\right.}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \cos\left(2x^2\right)d\right.}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{4c\sqrt{2\pi}\sqrt{c-a^2cx^2}C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right.}{3a\sqrt{1-a^2x^2}}$$

Mathematica [C] time = 1.33268, size = 251, normalized size = 1.22

$$\frac{c\sqrt{c-a^2cx^2}\left(-16\sqrt{2}\left(-i\sin^{-1}(ax)\right)^{3/2}\text{Gamma}\left(\frac{1}{2},-2i\sin^{-1}(ax)\right) - 16\sqrt{2}\left(i\sin^{-1}(ax)\right)^{3/2}\text{Gamma}\left(\frac{1}{2},2i\sin^{-1}(ax)\right) - 16\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(5/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(-14 - E^((-4*I)*ArcSin[a*x]) - E^((4*I)*ArcSin[a*x]
) + 16*a^2*x^2 + ((8*I)*ArcSin[a*x])/E^((4*I)*ArcSin[a*x]) - (8*I)*E^((4*I)
*ArcSin[a*x])*ArcSin[a*x] + 64*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] - 16*Sqrt[
2]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcSin[a*x]] - 16*Sqrt[2]*(I*
ArcSin[a*x])^(3/2)*Gamma[1/2, (2*I)*ArcSin[a*x]] - 16*((-I)*ArcSin[a*x])^(3
/2)*Gamma[1/2, (-4*I)*ArcSin[a*x]] - 16*(I*ArcSin[a*x])^(3/2)*Gamma[1/2, (4
*I)*ArcSin[a*x]]))/(24*a*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))
```

Maple [F] time = 0.183, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{\frac{3}{2}}\left(\arcsin(ax)\right)^{-\frac{5}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-a^2cx^2 + c\right)^{\frac{3}{2}}}{\arcsin\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/arcsin(a*x)^(5/2), x)
```

3.478 $\int \frac{\sqrt{c-a^2cx^2}}{\sin^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=130

$$-\frac{8\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}+\frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}}-\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(3*a*ArcSin[a*x]^(3/2)) + (8*x*S
qrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (8*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```

Rubi [A] time = 0.0733973, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4659, 4631, 3304, 3352}

$$-\frac{8\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}+\frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}}-\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(5/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(3*a*ArcSin[a*x]^(3/2)) + (8*x*S
qrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (8*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```

Rule 4659

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*(a + b*ArcSin[c*x])^(n + 1
))/(b*c*(n + 1)), x] + Dist[(c*(2*p + 1)*d^IntPart[p]*(d + e*x^2)^FracPart[
p])/(b*(n + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a
 + b*ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^
2*d + e, 0] && LtQ[n, -1]
```

Rule 4631

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^m*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] - Dist
[1/(b*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[(a + b*x)^(n + 1), Sin
[x]^(m - 1)*(m - (m + 1)*Sin[x]^2), x], x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{c-a^2cx^2}}{\sin^{-1}(ax)^{5/2}}\,dx &= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} - \frac{\left(4a\sqrt{c-a^2cx^2}\right)\int \frac{x}{\sin^{-1}(ax)^{3/2}}\,dx}{3\sqrt{1-a^2x^2}} \\ &= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(8\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{3a\sqrt{1-a^2x^2}} \\ &= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \cos\left(2x^2\right)\,dx, x, \sqrt{\sin^{-1}(ax)}\right)}{3a\sqrt{1-a^2x^2}} \\ &= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{8\sqrt{\pi}\sqrt{c-a^2cx^2}\,C\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}\end{aligned}$$

Mathematica [C] time = 0.470017, size = 142, normalized size = 1.09

$$\frac{2\sqrt{c-a^2cx^2}\left(-\sqrt{2}\left(-i\sin^{-1}(ax)\right)^{3/2}\text{Gamma}\left(\frac{1}{2},-2i\sin^{-1}(ax)\right)+\frac{\sqrt{2}\sin^{-1}(ax)^2\text{Gamma}\left(\frac{1}{2},2i\sin^{-1}(ax)\right)}{\sqrt{i\sin^{-1}(ax)}}+a^2x^2+4ax\sqrt{1-a^2x^2}\ldots\right)}{3a\sqrt{1-a^2x^2}\sin^{-1}(ax)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(5/2),x]
```

```
[Out] (2*Sqrt[c - a^2*c*x^2]*(-1 + a^2*x^2 + 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]
- Sqrt[2]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcSin[a*x]] + (Sqrt[2
]*ArcSin[a*x]^2*Gamma[1/2, (2*I)*ArcSin[a*x]])/Sqrt[I*ArcSin[a*x]]))/(3*a*S
qrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))
```

Maple [F] time = 0.236, size = 0, normalized size = 0.

$$\int \sqrt{-a^2cx^2+c}\,(\arcsin(ax))^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-a^2cx^2 + c}}{\arcsin\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)/arcsin(a*x)^(5/2), x)
```

3.479 $\int \frac{1}{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=44

$$-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))
```

Rubi [A] time = 0.0690032, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4643, 4641}

$$-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))
```

Rule 4643

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcSin[c*x])^n
/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e
, 0] &&  !GtQ[d, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{5/2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{1}{\sqrt{1-a^2x^2}\sin^{-1}(ax)^{5/2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= -\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.0534622, size = 44, normalized size = 1.

$$-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\sin^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))
```

Maple [A] time = 0.036, size = 38, normalized size = 0.9

$$-\frac{2}{3a}\sqrt{-a^2x^2+1}\,(\arcsin(ax))^{-\frac{3}{2}}\frac{1}{\sqrt{-c\left(a^2x^2-1\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] -2/3/arcsin(a*x)^(3/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 1.95064, size = 112, normalized size = 2.55

$$\frac{2\sqrt{-a^2cx^2+c}\sqrt{-a^2x^2+1}}{3\left(a^3cx^2-ac\right)\arcsin(ax)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(-a^2*c*x^2 + c)*sqrt(-a^2*x^2 + 1)/((a^3*c*x^2 - a*c)*arcsin(a*x)^
(3/2))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a^2cx^2+c}\arcsin(ax)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(5/2)), x)
```

3.480 $\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=106

$$\frac{4a\sqrt{1-a^2x^2}\,\text{Unintegrable}\left(\frac{x}{\left(1-a^2x^2\right)^2\sin^{-1}(ax)^{3/2}},x\right)}{3c\sqrt{c-a^2cx^2}}-\frac{2\sqrt{1-a^2x^2}}{3a\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)) + (4*a
*Sqrt[1 - a^2*x^2]*Unintegrable[x/((1 - a^2*x^2)^2*ArcSin[a*x]^(3/2)), x])/
(3*c*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0870418, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)) + (4*a
*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^2*ArcSin[a*x]^(3/2)), x])/(3
*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{3a\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}+\frac{\left(4a\sqrt{1-a^2x^2}\right)\int \frac{x}{\left(1-a^2x^2\right)^2\sin^{-1}(ax)^{3/2}}\,dx}{3c\sqrt{c-a^2cx^2}}$$

Mathematica [A] time = 0.838005, size = 0, normalized size = 0.

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)), x]
```

Maple [A] time = 0.206, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{-\frac{3}{2}}\left(\arcsin(ax)\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}\arcsin\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(5/2)), x)
```

3.481 $\int \frac{1}{(c-a^2cx^2)^{5/2}\sin^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=106

$$\frac{8a\sqrt{1-a^2x^2}\,\text{Unintegrable}\left(\frac{x}{(1-a^2x^2)^3\sin^{-1}(ax)^{3/2}},x\right)}{3c^2\sqrt{c-a^2cx^2}}-\frac{2\sqrt{1-a^2x^2}}{3a(c-a^2cx^2)^{5/2}\sin^{-1}(ax)^{3/2}}$$

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)) + (8*a
*Sqrt[1 - a^2*x^2]*Unintegrable[x/((1 - a^2*x^2)^3*ArcSin[a*x]^(3/2)), x])/
(3*c^2*Sqrt[c - a^2*c*x^2])
```

Rubi [A] time = 0.0889734, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sin^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)) + (8*a
*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^3*ArcSin[a*x]^(3/2)), x])/(3
*c^2*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sin^{-1}(ax)^{5/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{3a(c-a^2cx^2)^{5/2}\sin^{-1}(ax)^{3/2}}+\frac{\left(8a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^3\sin^{-1}(ax)^{3/2}}\,dx}{3c^2\sqrt{c-a^2cx^2}}$$

Mathematica [A] time = 1.92911, size = 0, normalized size = 0.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sin^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)), x]
```

Maple [A] time = 0.293, size = 0, normalized size = 0.

$$\int \left(-a^2cx^2+c\right)^{-\frac{5}{2}}(\arcsin(ax))^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-a^2cx^2+c\right)^{\frac{5}{2}}\arcsin\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^(5/2)), x)
```

3.482 $\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx$

Optimal. Leaf size=259

$$\frac{i2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{4i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c^3\sqrt{1-c^2x^2}}-\frac{i2^{-2(n+3)}e^{\frac{4ia}{b}}\sqrt{d-c^2dx}}{}$$

```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c^3*(1 + n)*Sqrt[1 -
 c^2*x^2]) + (I*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4
*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^
2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*E^(((4*I)*a)/b)*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(
2^(2*(3 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.455666, antiderivative size = 259, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {4725, 4723, 4406, 3307, 2181}

$$\frac{i2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{4i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c^3\sqrt{1-c^2x^2}}-\frac{i2^{-2(n+3)}e^{\frac{4ia}{b}}\sqrt{d-c^2dx}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```


```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c^3*(1 + n)*Sqrt[1 -
 c^2*x^2]) + (I*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4
*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^
2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*E^(((4*I)*a)/b)*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(
2^(2*(3 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```


Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.)*((d_) + (e_.)*(x_)^2
)^(p_), x_Symbol] :> Dist[(d^IntPart[p]*(d + e*x^2)^FracPart[p])/(1 - c^2*x
^2)^FracPart[p], Int[x^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p,
 -1] && IGtQ[m, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 3307

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx = \frac{\sqrt{d-c^2dx^2}\int x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int (a+bx)^n\cos^2(x)\sin^2(x)\,dx,x,\sin^{-1}(cx)\right)}{c^3\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int \left(\frac{1}{8}(a+bx)^n-\frac{1}{8}(a+bx)^n\cos(4x)\right)dx,x,\sin^{-1}(cx)\right)}{c^3\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int (a+bx)^n\cos(4x)\,dx\right.}{8c^3\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int e^{-4ix}(a+bx)^n\,dx,x,\right.}{16c^3\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}} + \frac{i4^{-3-n}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(\right.}{c^3\sqrt{1}}$$

Mathematica [A] time = 0.832689, size = 189, normalized size = 0.73

$$\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(\frac{8\left(a+b\sin^{-1}(cx)\right)}{bn+b}+i4^{-n}e^{-\frac{4ia}{b}}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{-n}\left(\left(\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^n\mathrm{Gamma}\left(n+1,-\frac{4i\left(a+b\sin\right.}{b}\right.\right.\right.}{64c^3\sqrt{d\left(1-c^2x^2\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((8*(a + b*ArcSin[c*x]))/(b + b*
n) + (I*(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c
*x]))/b] - E^(((8*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((
4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I)*a)/b)*((a + b*ArcSin[c*x])^2/
b^2)^n)))/(64*c^3*Sqrt[d*(1 - c^2*x^2)])
```

Maple [F] time = 0.36, size = 0, normalized size = 0.

$$\int x^2 \sqrt{-c^2 d x^2 + d}\, (a + b \arcsin(cx))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2 d x^2 + d} (b \arcsin(cx) + a)^n x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2 d x^2 + d} (b \arcsin(cx) + a)^n x^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2 d x^2 + d} (b \arcsin(cx) + a)^n x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

3.483 $\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx$

Optimal. Leaf size=391

$$-\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{3^{-n-1}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{}$$

```
[Out] -(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSi
n[c*x]))/b])/(8*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]
))/b)^n) - (E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 +
 n, (I*(a + b*ArcSin[c*x]))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[
c*x]))/b)^n) - (3^(-1 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[
1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*c^2*E^(((3*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(-1 - n)*E^(((3*I)*a)/b)*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]
))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.440236, antiderivative size = 391, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4725, 4723, 4406, 3308, 2181}

$$-\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{3^{-n-1}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSi
n[c*x]))/b])/(8*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]
))/b)^n) - (E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 +
 n, (I*(a + b*ArcSin[c*x]))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[
c*x]))/b)^n) - (3^(-1 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[
1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*c^2*E^(((3*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(-1 - n)*E^(((3*I)*a)/b)*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]
))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.)*((d_) + (e_.)*(x_)^2
)^(p_), x_Symbol] :> Dist[(d^IntPart[p]*(d + e*x^2)^FracPart[p])/(1 - c^2*x
^2)^FracPart[p], Int[x^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p,
 -1] && IGtQ[m, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3308

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx = \frac{\sqrt{d-c^2dx^2}\int x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int(a+bx)^n\cos^2(x)\sin(x)\,dx,x,\sin^{-1}(cx)\right)}{c^2\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int\left(\frac{1}{4}(a+bx)^n\sin(x)+\frac{1}{4}(a+bx)^n\sin(3x)\right)dx,x,\sin^{-1}(cx\right.}{c^2\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int(a+bx)^n\sin(x)\,dx,x,\sin^{-1}(cx)\right)}{4c^2\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int\right.}{}$$
$$= \frac{\left(i\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-ix}(a+bx)^n\,dx,x,\sin^{-1}(cx)\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{\left(i\sqrt{d-c^2dx^2}\right)\text{Subst}}{8}$$
$$= -\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right.}{8c^2\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.840741, size = 272, normalized size = 0.7

$$\frac{de^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(3e^{\frac{2ia}{b}}\left(\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\left(-\text{Gamma}\left(n+1,-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\right)-e^{\frac{2ia}{b}}\left(\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(3*E^(((2*I)*a)/b)*(-(Gamma[1 +
n, ((-I)*(a + b*ArcSin[c*x]))/b]/(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (E^(((
2*I)*a)/b)*Gamma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/((I*(a + b*ArcSin[c*x])
)/b)^n) - (((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin
```

```
[c*x]))/b] + E^(((6*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
((3*I)*(a + b*ArcSin[c*x]))/b])/(3^n*((a + b*ArcSin[c*x])^2/b^2)^n)))/(24*c
^2*E^(((3*I)*a)/b)*Sqrt[d*(1 - c^2*x^2)])
```

Maple [F] time = 0.225, size = 0, normalized size = 0.

$$\int x\sqrt{-c^2dx^2+d}\,(a+b\arcsin(cx))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\sqrt{-d(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}(cx))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Integral(x*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)^n x\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x, x)
```

3.484 $\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx$

Optimal. Leaf size=259

$$-\frac{i2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c\sqrt{1-c^2x^2}}+\frac{i2^{-n-3}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(\right.}{}$$

```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(2*b*c*(1 + n)*Sqrt[1 - c
^2*x^2]) - (I*2^(-3 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
+ n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2*x^2]*
(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*E^(((2*I)*a)/b)*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b
])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.292758, antiderivative size = 259, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4663, 4661, 3312, 3307, 2181}

$$-\frac{i2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c\sqrt{1-c^2x^2}}+\frac{i2^{-n-3}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(2*b*c*(1 + n)*Sqrt[1 - c
^2*x^2]) - (I*2^(-3 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
+ n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2*x^2]*
(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*E^(((2*I)*a)/b)*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b
])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 4663

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(d^(p - 1/2)*Sqrt[d + e*x^2])/Sqrt[1 - c^2*x^2], Int[(1 -
c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IGtQ[2*p, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3307

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx &= \frac{\sqrt{d-c^2dx^2}\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int (a+bx)^n\cos^2(x)\,dx,x,\sin^{-1}(cx)\right)}{c\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int \left(\frac{1}{2}(a+bx)^n+\frac{1}{2}(a+bx)^n\cos(2x)\right)dx,x,\sin^{-1}(cx)\right)}{c\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int (a+bx)^n\cos(2x)\,dx,x\right.}{2c\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int e^{-2ix}(a+bx)^n\,dx,x,\mathrm{si}\right.}{4c\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-3-n}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\right.}{c\sqrt{1-}}
\end{aligned}
$$

Mathematica [A] time = 0.752975, size = 182, normalized size = 0.7

$$
\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-i2^{-n}e^{-\frac{2ia}{b}}\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\mathrm{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+i2^{-n}e^{\frac{2ia}{b}}\left(\frac{i\left(a+b\sin^{-1}(cx\right.}{b}\right.\right.}{8c\sqrt{d\left(1-c^2x^2\right)}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((4*a + 4*b*ArcSin[c*x])/(b + b*
n) - (I*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*E^(((2*I)*a)/b)*
(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*E^(((2*I)*a)/b)*Gamma[1 + n, ((2*I)*
(a + b*ArcSin[c*x]))/b])/(2^n*((I*(a + b*ArcSin[c*x]))/b)^n)))/(8*c*Sqrt[d*
(1 - c^2*x^2)])
```

Maple [F] time = 0.21, size = 0, normalized size = 0.

$$
\int \sqrt{-c^2dx^2+d}\,(a+b\arcsin(cx))^n\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-d(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

3.485 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x}\,dx$

Optimal. Leaf size=218

$$d\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^n}{x\sqrt{d-c^2dx^2}},x\right)+\frac{de^{-\frac{ia}{b}}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i\left(a+b\right.}{}\right.}{2\sqrt{d-c^2dx^2}}$$

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin
[c*x]))/b])/(2*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/
b)^n) + (d*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n,
 (I*(a + b*ArcSin[c*x]))/b])/(2*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x])
)/b)^n) + d*Unintegrable[(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]), x]
```

Rubi [A] time = 0.138297, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] Defer[Int][(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x, x]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x}\,dx=\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x}\,dx$$

Mathematica [A] time = 0.191729, size = 0, normalized size = 0.

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [A] time = 0.434, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^n}{x}\sqrt{-c^2dx^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x)
```

```
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x, x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-d(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n/x,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n/x, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x, x)
```

3.486 $\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$

Optimal. Leaf size=87

$$d\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^n}{x^2\sqrt{d-c^2dx^2}},x\right)-\frac{cd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^{n+1}}{b(n+1)\sqrt{d-c^2dx^2}}$$

```
[Out] -((c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(b*(1 + n)*Sqrt[d - c
^2*d*x^2])) + d*Unintegrable[(a + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]
), x]
```

Rubi [A] time = 0.141865, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] Defer[Int][(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx=\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$$

Mathematica [A] time = 0.256699, size = 0, normalized size = 0.

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [A] time = 0.217, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^n}{x^2}\sqrt{-c^2dx^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

```
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)^n}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)^n}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-d(cx - 1)(cx + 1)}(a + b \operatorname{asin}(cx))^n}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n/x**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n/x**2, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-c^2dx^2 + d}(b \arcsin(cx) + a)^n}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x^2, x)
```

3.487 $\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^n \, dx$

Optimal. Leaf size=684

$$-\frac{id2^{-n-7}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c^3\sqrt{1-c^2x^2}}+\frac{id2^{-2n-7}e^{-\frac{4ia}{b}}\sqrt{d-}}{}$$

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c^3*(1 + n)*Sqrt[
1 - c^2*x^2]) - (I*2^(-7 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sqrt[1 -
c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d*E^(((2*I)*a)/b
)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcS
in[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^
(-7 - 2*n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)
*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a
+ b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - 2*n)*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(c^
3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 -
n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-6*I)*(a + b*
ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcS
in[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d*E^(((6*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(c
^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.810245, antiderivative size = 684, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {4725, 4723, 4406, 3307, 2181}

$$-\frac{id2^{-n-7}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c^3\sqrt{1-c^2x^2}}+\frac{id2^{-2n-7}e^{-\frac{4ia}{b}}\sqrt{d-}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```


```
[Out] (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c^3*(1 + n)*Sqrt[
1 - c^2*x^2]) - (I*2^(-7 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sqrt[1 -
c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d*E^(((2*I)*a)/b
)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcS
in[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^
(-7 - 2*n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)
*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a
+ b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - 2*n)*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(c^
3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 -
n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-6*I)*(a + b*
ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcS
in[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d*E^(((6*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(c
^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```


Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.)*((d_) + (e_.)*(x_)^2
)^(p_), x_Symbol] :> Dist[(d^IntPart[p]*(d + e*x^2)^FracPart[p])/(1 - c^2*x
^2)^FracPart[p], Int[x^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p,
 -1] && IGtQ[m, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3307

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx=\frac{\left(d\sqrt{d-c^2dx^2}\right)\int x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)^n\cos^4(x)\sin^2(x)\,dx,x,\sin^{-1}(cx)\right)}{c^3\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(\frac{1}{16}(a+bx)^n+\frac{1}{32}(a+bx)^n\cos(2x)-\frac{1}{16}(a+bx)^n\operatorname{co}\right.\right.}{c^3\sqrt{1-c^2x^2}}$$

$$=\frac{d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)^n\cos(2\right.}{32c^3\sqrt{1-c^2x^2}}$$

$$=\frac{d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int e^{-2ix}(a+bx)^n\,d\right.}{64c^3\sqrt{1-c^2x^2}}$$

$$=\frac{d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-7-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{c^3\sqrt{}}$$

Mathematica [A] time = 3.2099, size = 436, normalized size = 0.64

$$d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(3i2^{-n}e^{-\frac{2ia}{b}}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{-n}\left(e^{\frac{4ia}{b}}\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^n\text{Gamma}\left(n+1,\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((24*(a + b*ArcSin[c*x]))/(b +
 b*n) + ((3*I)*(-(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-2*I)*(a + b
*ArcSin[c*x]))/b]) + E^(((4*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma
[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b]))/(2^n*E^(((2*I)*a)/b)*((a + b*ArcSi
n[c*x])^2/b^2)^n) + ((3*I)*(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4
*I)*(a + b*ArcSin[c*x]))/b] - E^(((8*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b
)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I)*a)/b)*((a
+ b*ArcSin[c*x])^2/b^2)^n) + (I*(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
 ((-6*I)*(a + b*ArcSin[c*x]))/b] - E^(((12*I)*a)/b)*(((-I)*(a + b*ArcSin[c*
x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b]))/(6^n*E^(((6*I)*a)/b
)*((a + b*ArcSin[c*x])^2/b^2)^n)))/(384*c^3*Sqrt[d - c^2*d*x^2])
```

Maple [F] time = 0.267, size = 0, normalized size = 0.

$$\int x^2\left(-c^2dx^2+d\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\left(-c^2dx^2+d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^n x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(c^2dx^4-dx^2\right)\sqrt{-c^2dx^2+d}\left(b\arcsin\left(cx\right)+a\right)^n,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral(-(c^2*d*x^4 - d*x^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}} (b \arcsin(cx) + a)^n x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

3.488 $\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx$

Optimal. Leaf size=595

$$-\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16c^2\sqrt{1-c^2x^2}}-\frac{d3^{-n}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}\,(a+\cdots}{\cdots}$$

```
[Out] -(d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*Arc
Sin[c*x]))/b])/(16*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c
*x]))/b)^n) - (d*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(16*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*A
rcSin[c*x]))/b)^n) - (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 +
 n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(32*3^n*c^2*E^(((3*I)*a)/b)*Sqrt[1 - c
^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d*E^(((3*I)*a)/b)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/
(32*3^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (5^(-1 - n)*
d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-5*I)*(a + b*Arc
Sin[c*x]))/b])/(32*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcS
in[c*x]))/b)^n) - (5^(-1 - n)*d*E^(((5*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/(32*c^2*Sqrt[1
- c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.586051, antiderivative size = 595, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4725, 4723, 4406, 3308, 2181}

$$-\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{16c^2\sqrt{1-c^2x^2}}-\frac{d3^{-n}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}\,(a+\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```


```
[Out] -(d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*Arc
Sin[c*x]))/b])/(16*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c
*x]))/b)^n) - (d*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(16*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*A
rcSin[c*x]))/b)^n) - (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 +
 n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(32*3^n*c^2*E^(((3*I)*a)/b)*Sqrt[1 - c
^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d*E^(((3*I)*a)/b)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/
(32*3^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (5^(-1 - n)*
d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-5*I)*(a + b*Arc
Sin[c*x]))/b])/(32*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcS
in[c*x]))/b)^n) - (5^(-1 - n)*d*E^(((5*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/(32*c^2*Sqrt[1
- c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```


Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.)*((d_) + (e_.)*(x_)^2
)^(p_), x_Symbol] :> Dist[(d^IntPart[p]*(d + e*x^2)^FracPart[p])/(1 - c^2*x
^2)^FracPart[p], Int[x^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p,
```

```
-1] && IGtQ[m, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3308

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx=\frac{\left(d\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^4(x)\sin(x)\,dx,x,\sin^{-1}(cx)\right)}{c^2\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{8}(a+bx)^n\sin(x)+\frac{3}{16}(a+bx)^n\sin(3x)+\frac{1}{16}(a+bx\right.\right.}{c^2\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\sin(5x)\,dx,x,\sin^{-1}(cx)\right)}{16c^2\sqrt{1-c^2x^2}}+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{S}}{}$$

$$=\frac{\left(id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-5ix}(a+bx)^n\,dx,x,\sin^{-1}(cx)\right)}{32c^2\sqrt{1-c^2x^2}}-\frac{\left(id\sqrt{d-c^2dx^2}\right)\text{Su}}{}$$

$$=-\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i\left(a+b\sin^{-1}(cx\right.}{b}\right.}{16c^2\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 2.09228, size = 464, normalized size = 0.78

$$-\frac{d^2 15^{-n-1}e^{-\frac{5ia}{b}}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{-3n}\left(\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^n\left(2\,15^{n+1}e^{\frac{6ia}{b}}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{2n}\text{Gamma}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -(15^(-1 - n)*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(2*15^(1 + n)*E^(
((4*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*((a + b*ArcSin[c*x])^2/b^2)^(2*n
)*Gamma[1 + n, ((-I)*(a + b*ArcSin[c*x]))/b] + (((-I)*(a + b*ArcSin[c*x]))/
b)^n*(2*15^(1 + n)*E^(((6*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[
1 + n, (I*(a + b*ArcSin[c*x]))/b] + 3*(5^(1 + n)*E^(((2*I)*a)/b)*((I*(a + b
*ArcSin[c*x]))/b)^(2*n)*((a + b*ArcSin[c*x])^2/b^2)^n*Gamma[1 + n, ((-3*I)*
(a + b*ArcSin[c*x]))/b] + 5^(1 + n)*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x])^2/
b^2)^(2*n)*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b] + 3^n*((((-I)*(a + b
*ArcSin[c*x]))/b)^n*((I*(a + b*ArcSin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-5*I)*
(a + b*ArcSin[c*x]))/b] + E^(((10*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n
)*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])))))/(32*c^2*E^(((5*I)*a)/b)*
Sqrt[d - c^2*d*x^2]*((a + b*ArcSin[c*x])^2/b^2)^(3*n))
```

Maple [F] time = 0.171, size = 0, normalized size = 0.

$$\int x\left(-c^2dx^2+d\right)^{\frac{3}{2}}(a+b\arcsin(cx))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\left(c^2dx^3-dx\right)\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*d*x^3 - d*x)*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)

[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{3}{2}}(b \arcsin{(cx)} + a)^n x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")

[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x, x)
```

3.489 $\int \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^n \, dx$

Optimal. Leaf size=466

$$-\frac{id2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c\sqrt{1-c^2x^2}}-\frac{id2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-}}{}$$

```
[Out] (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c*(1 + n)*Sqrt[1
 - c^2*x^2]) - (I*2^(-3 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*d*E^(((2*I)*a)/b)*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[
c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I*d*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x
]))/b])/(2^(2*(3 + n))*c*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Ar
cSin[c*x]))/b)^n) + (I*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c*Sqrt[
1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.406926, antiderivative size = 466, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4663, 4661, 3312, 3307, 2181}

$$-\frac{id2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c\sqrt{1-c^2x^2}}-\frac{id2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```


```
[Out] (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c*(1 + n)*Sqrt[1
 - c^2*x^2]) - (I*2^(-3 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*d*E^(((2*I)*a)/b)*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[
c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I*d*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x
]))/b])/(2^(2*(3 + n))*c*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Ar
cSin[c*x]))/b)^n) + (I*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c*Sqrt[
1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```


Rule 4663

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(d^(p - 1/2)*Sqrt[d + e*x^2])/Sqrt[1 - c^2*x^2], Int[(1 -
c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IGtQ[2*p, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
```

```
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3307

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx &= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int (a+bx)^n\cos^4(x)\,dx,x,\sin^{-1}(cx)\right)}{c\sqrt{1-c^2x^2}}\\
&= \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{3}{8}(a+bx)^n+\frac{1}{2}(a+bx)^n\cos(2x)+\frac{1}{8}(a+bx)^n\cos(4x\right.\right.}{c\sqrt{1-c^2x^2}}\\
&= \frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int (a+bx)^n\cos(4x)\right.}{8c\sqrt{1-c^2x^2}}\\
&= \frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-4ix}(a+bx)^n\,dx\right.}{16c\sqrt{1-c^2x^2}}\\
&= \frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-3-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n}{c\sqrt{1}}
\end{aligned}$$

Mathematica [A] time = 1.65971, size = 326, normalized size = 0.7

$$\frac{d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(i4^{-n}e^{-\frac{4ia}{b}}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{-n}\left(e^{\frac{8ia}{b}}\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^n\text{Gamma}\left(n+1,\frac{4i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-\left(\frac{i(a+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((-8*(a + b*ArcSin[c*x]))/(b +
 b*n) + 8*((4*a + 4*b*ArcSin[c*x])/(b + b*n) - (I*Gamma[1 + n, ((-2*I)*(a +
```

```
 b*ArcSin[c*x]))/b])/(2^n*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n)
 + (I*E^(((2*I)*a)/b)*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*((I
*(a + b*ArcSin[c*x]))/b)^n)) + (I*(-(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1
+ n, ((-4*I)*(a + b*ArcSin[c*x]))/b]) + E^(((8*I)*a)/b)*(((-I)*(a + b*ArcSi
n[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I)*
a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n)))/(64*c*Sqrt[d - c^2*d*x^2])
```

Maple [F] time = 0.133, size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (a+b\arcsin(cx))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (b\arcsin(cx)+a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(-c^2dx^2+d\right)^{\frac{3}{2}} (b\arcsin(cx)+a)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n, x)
```

3.490 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x}\,dx$

Optimal. Leaf size=426

$$d^2\text{Unintegrable}\left(\frac{(a+b\sin^{-1}(cx))^n}{x\sqrt{d-c^2dx^2}},x\right)+\frac{5d^2e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^n\left(-\frac{i(a+b\sin^{-1}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i}{}\right.}{8\sqrt{d-c^2dx^2}}$$

```
[Out] (5*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*Ar
cSin[c*x]))/b])/(8*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x
]))/b)^n) + (5*d^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(8*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcS
in[c*x]))/b)^n) + (3^(-1 - n)*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*E^(((3*I)*a)/b)*Sqrt[d - c^
2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (3^(-1 - n)*d^2*E^(((3*I)*a)/b
)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin
[c*x]))/b])/(8*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^2*Uni
ntegrable[(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]), x]
```

Rubi [A] time = 0.158824, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] Defer[Int][((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x}\,dx=\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x}\,dx$$

Mathematica [A] time = 0.20463, size = 0, normalized size = 0.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [A] time = 0.162, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^n}{x}\left(-c^2dx^2+d\right)^{\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x)
```

```
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
```

```
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x, x)
```

3.491 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x^2}\,dx$

Optimal. Leaf size=297

$$d^2\text{Unintegrable}\left(\frac{(a+b\sin^{-1}(cx))^n}{x^2\sqrt{d-c^2dx^2}},x\right)+\frac{icd^2 2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^n\left(-\frac{i(a+b\sin^{-1}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1\right.}{\sqrt{d-c^2dx^2}}$$

```
[Out] (-3*c*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(2*b*(1 + n)*Sqrt[
d - c^2*d*x^2]) + (I*2^(-3 - n)*c*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(E^(((2*I)*a)/b)*Sqrt[d -
c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-3 - n)*c*d^2*E^(((2*I
)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*
ArcSin[c*x]))/b])/(Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^2
*Unintegrable[(a + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]), x]
```

Rubi [A] time = 0.158301, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2,x]

[Out] Defer[Int][((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x^2}\,dx=\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x^2}\,dx$$

Mathematica [A] time = 0.714526, size = 0, normalized size = 0.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))^n}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2,x]

[Out] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [A] time = 0.196, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^n}{x^2}\left(-c^2dx^2+d\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

```
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
```

```
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n/x**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

3.492 $\int x^2 \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^n \, dx$

Optimal. Leaf size=906

result too large to display

```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(128*b*c^3*(1 + n)*
Sqrt[1 - c^2*x^2]) - (I*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d^2*E^(((
2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a
 + b*ArcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n
) + (I*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(
a + b*ArcSin[c*x]))/b])/(2^(2*(4 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*d^2*E^(((4*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2
^(2*(4 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-
7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n
, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(
((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I)*a
)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*A
rcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I
*2^(-11 - 3*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(-8*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((8*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-
I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-11 - 3*n)*d^2*E^(((8*I)*a)/b)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((8*I)*(a + b*ArcSin[c*x])
)/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.959616, antiderivative size = 906, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {4725, 4723, 4406, 3307, 2181}

$$-\frac{i2^{-n-7}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n \text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}}{c^3\sqrt{1-c^2x^2}}+\frac{i2^{-2(n+4)}d^2e^{-\frac{4ia}{b}}\sqrt{}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```


```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(128*b*c^3*(1 + n)*
Sqrt[1 - c^2*x^2]) - (I*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d^2*E^(((
2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a
 + b*ArcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n
) + (I*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(
a + b*ArcSin[c*x]))/b])/(2^(2*(4 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*d^2*E^(((4*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2
^(2*(4 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-
7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n
, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(
((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I)*a
)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*A
rcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I
```

```
*2^(-11 - 3*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(-8*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((8*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-
I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-11 - 3*n)*d^2*E^(((8*I)*a)/b)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((8*I)*(a + b*ArcSin[c*x])
)/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.)*((d_) + (e_.)*(x_)^2
)^(p_), x_Symbol] :> Dist[(d^IntPart[p]*(d + e*x^2)^FracPart[p])/(1 - c^2*x
^2)^FracPart[p], Int[x^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p,
 -1] && IGtQ[m, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3307

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^6(x)\sin^2(x)\,dx,x,\sin^{-1}(cx)\right)}{c^3\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{5}{128}(a+bx)^n+\frac{1}{32}(a+bx)^n\cos(2x)-\frac{1}{32}(a+b\right.\right.}{c^3\sqrt{1}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\right.}{128c^3\sqrt{1-c^2}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-8ix}(a+\right.}{256c^3\sqrt{1-c^2x}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{}$$

Mathematica [A] time = 4.21847, size = 989, normalized size = 1.09

$$\frac{2^{-3n-11}3^{-n-1}d^3e^{-\frac{8ia}{b}}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{-n}\left(i3^{n+1}4^{n+2}be^{\frac{10ia}{b}}(n+1)\text{Gamma}\left(n+1,\frac{2i\left(a+b\sin^{-1}(c\right.}{b}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (2^(-11 - 3*n)*3^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(5*2^
(4 + 3*n)*3^(1 + n)*a*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n + 5*2^(
4 + 3*n)*3^(1 + n)*b*E^(((8*I)*a)/b)*ArcSin[c*x]*((a + b*ArcSin[c*x])^2/b^2
)^n - I*3^(1 + n)*4^(2 + n)*b*E^(((6*I)*a)/b)*(1 + n)*((I*(a + b*ArcSin[c*x
]))/b)^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 + n)*4^(2 +
n)*b*E^(((10*I)*a)/b)*(1 + n)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
 ((2*I)*(a + b*ArcSin[c*x]))/b] + I*2^(3 + n)*3^(1 + n)*b*E^(((4*I)*a)/b)*(
(I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b] +
 I*2^(3 + n)*3^(1 + n)*b*E^(((4*I)*a)/b)*n*((I*(a + b*ArcSin[c*x]))/b)^n*Ga
mma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b] - I*2^(3 + n)*3^(1 + n)*b*E^(((1
2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcS
in[c*x]))/b] - I*2^(3 + n)*3^(1 + n)*b*E^(((12*I)*a)/b)*n*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b] + I*4^(2 + n)*b
*E^(((2*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-6*I)*(a + b*
ArcSin[c*x]))/b] + I*4^(2 + n)*b*E^(((2*I)*a)/b)*n*((I*(a + b*ArcSin[c*x]))
/b)^n*Gamma[1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b] - I*4^(2 + n)*b*E^(((14*
I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin
[c*x]))/b] - I*4^(2 + n)*b*E^(((14*I)*a)/b)*n*(((-I)*(a + b*ArcSin[c*x]))/b
)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 + n)*b*((I*(a + b*
ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-8*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 +
n)*b*n*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-8*I)*(a + b*ArcSin[c*x
]))/b] - I*3^(1 + n)*b*E^(((16*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Ga
mma[1 + n, ((8*I)*(a + b*ArcSin[c*x]))/b] - I*3^(1 + n)*b*E^(((16*I)*a)/b)*
n*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((8*I)*(a + b*ArcSin[c*x]))
/b]))/(b*c^3*E^(((8*I)*a)/b)*(1 + n)*Sqrt[d - c^2*d*x^2]*((a + b*ArcSin[c*x
])^2/b^2)^n)
```

Maple [F] time = 0.259, size = 0, normalized size = 0.

$$\int x^{2} \left(-c^{2} d x^{2}+d\right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{n}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin \left(c x\right) + a\right)}^{n} x^{2}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left({\left(c^{4} d^{2} x^{6} - 2 \, c^{2} d^{2} x^{4} + d^{2} x^{2}\right)} \sqrt{-c^{2} d x^{2} + d} {\left(b \arcsin \left(c x\right) + a\right)}^{n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral((c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2)*sqrt(-c^2*d*x^2 + d)*(b*ar
csin(c*x) + a)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin \left(c x\right) + a\right)}^{n} x^{2}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

3.493 $\int x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx$

Optimal. Leaf size=815

result too large to display

```
[Out] (-5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b
*ArcSin[c*x]))/b])/(128*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n) - (5*d^2*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^n*Gamma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((
I*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*E^(((3*
I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d
^2*E^(((3*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin
[c*x]))/b)^n) - (d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n,
 ((-5*I)*(a + b*ArcSin[c*x]))/b])/(128*5^n*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d^2*E^(((5*I)*a)/b)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/
(128*5^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (7^(-1 - n)
*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-7*I)*(a + b*
ArcSin[c*x]))/b])/(128*c^2*E^(((7*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*
ArcSin[c*x]))/b)^n) - (7^(-1 - n)*d^2*E^(((7*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^n*Gamma[1 + n, ((7*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*
Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.734652, antiderivative size = 815, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4725, 4723, 4406, 3308, 2181}

$$-\frac{5d^2e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\text{Gamma}\left(n+1,-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}}{128c^2\sqrt{1-c^2x^2}}-\frac{3^{1-n}d^2e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}\left(a+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```


```
[Out] (-5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b
*ArcSin[c*x]))/b])/(128*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n) - (5*d^2*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^n*Gamma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((
I*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*E^(((3*
I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d
^2*E^(((3*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin
[c*x]))/b)^n) - (d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n,
 ((-5*I)*(a + b*ArcSin[c*x]))/b])/(128*5^n*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d^2*E^(((5*I)*a)/b)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/
(128*5^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (7^(-1 - n)
*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-7*I)*(a + b*
ArcSin[c*x]))/b])/(128*c^2*E^(((7*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*
ArcSin[c*x]))/b)^n) - (7^(-1 - n)*d^2*E^(((7*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^n*Gamma[1 + n, ((7*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*
```

```
Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.)*((d_) + (e_.)*(x_)^2
)^(p_), x_Symbol] :> Dist[(d^IntPart[p]*(d + e*x^2)^FracPart[p])/(1 - c^2*x
^2)^FracPart[p], Int[x^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p,
 -1] && IGtQ[m, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 3308

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^6(x)\sin(x)\,dx,x,\sin^{-1}(cx)\right)}{c^2\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{5}{64}(a+bx)^n\sin(x)+\frac{9}{64}(a+bx)^n\sin(3x)+\frac{5}{64}(a+\right.\right.}{c^2\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\sin(7x)\,dx,x,\sin^{-1}(cx)\right)}{64c^2\sqrt{1-c^2x^2}} + \frac{\left(5d^2\sqrt{d-c^2dx^2}\right.}{}$$

$$= \frac{\left(id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-7ix}(a+bx)^n\,dx,x,\sin^{-1}(cx)\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{\left(id^2\sqrt{d-c^2dx^2}\right)}{}$$

$$= -\frac{5d^2e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i\left(a+b\sin^{-1}\right.}{b}\right.}{128c^2\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 3.9743, size = 603, normalized size = 0.74

$$-\frac{d^3 5^{-n}21^{-n-1}e^{-\frac{7ia}{b}}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{-3n}\left(\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^n\left(9\,5^n7^{n+1}e^{\frac{4ia}{b}}\left(\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{2n}\left(\frac{(a+b\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -(21^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(105^(1 + n)*E^((
(6*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*((a + b*ArcSin[c*x])^2/b^2)^(2*n)
*Gamma[1 + n, ((-I)*(a + b*ArcSin[c*x]))/b] + (((-I)*(a + b*ArcSin[c*x]))/b
)^n*(105^(1 + n)*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[1
+ n, (I*(a + b*ArcSin[c*x]))/b] + 9*5^n*7^(1 + n)*E^(((4*I)*a)/b)*((I*(a +
b*ArcSin[c*x]))/b)^(2*n)*((a + b*ArcSin[c*x])^2/b^2)^n*Gamma[1 + n, ((-3*I)
*(a + b*ArcSin[c*x]))/b] + 9*5^n*7^(1 + n)*E^(((10*I)*a)/b)*((a + b*ArcSin[
c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b] + 3^(1 + n)*
(7^(1 + n)*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*((I*(a + b*ArcS
in[c*x]))/b)^(3*n)*Gamma[1 + n, ((-5*I)*(a + b*ArcSin[c*x]))/b] + 7^(1 + n)
*E^(((12*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((5*I)*(a
+ b*ArcSin[c*x]))/b] + 5^n*((((-I)*(a + b*ArcSin[c*x]))/b)^n*((I*(a + b*Arc
Sin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-7*I)*(a + b*ArcSin[c*x]))/b] + E^(((14*
I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((7*I)*(a + b*ArcSi
n[c*x]))/b])))))/(128*5^n*c^2*E^(((7*I)*a)/b)*Sqrt[d - c^2*d*x^2]*((a + b*A
rcSin[c*x])^2/b^2)^(3*n))
```

Maple [F] time = 0.174, size = 0, normalized size = 0.

$$\int x\left(-c^2dx^2+d\right)^{\frac{5}{2}}\left(a+b\arcsin(cx)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^n x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(c^4d^2x^5-2\,c^2d^2x^3+d^2x\right)\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral((c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x)*sqrt(-c^2*d*x^2 + d)*(b*arcs
in(c*x) + a)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^n x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x, x)
```

3.494 $\int \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^n \, dx$

Optimal. Leaf size=698

$$-\frac{15id^2 2^{-n-7} e^{-\frac{2ia}{b}} \sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx)\right)^n \left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n} \text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c\sqrt{1-c^2x^2}} - \frac{3id^2 2^{-2n-7} e^{-\frac{4ia}{b}} \sqrt{d}}{}$$

```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c*(1 + n)*Sqr
t[1 - c^2*x^2]) - ((15*I)*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((15*I)*2^(-7 - n)*d^2*
E^(((2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*
I)*(a + b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b
)^n) - ((3*I)*2^(-7 - 2*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((4*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((3*I)*2^(-7 - 2*n)*d^2*E^(((4*I)
*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b
*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I
*2^(-7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[
1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I
)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a +
b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rubi [A] time = 0.576922, antiderivative size = 698, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4663, 4661, 3312, 3307, 2181}

$$-\frac{15id^2 2^{-n-7} e^{-\frac{2ia}{b}} \sqrt{d-c^2dx^2} \left(a+b\sin^{-1}(cx)\right)^n \left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n} \text{Gamma}\left(n+1,-\frac{2i\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{c\sqrt{1-c^2x^2}} - \frac{3id^2 2^{-2n-7} e^{-\frac{4ia}{b}} \sqrt{d}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c*(1 + n)*Sqr
t[1 - c^2*x^2]) - ((15*I)*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((15*I)*2^(-7 - n)*d^2*
E^(((2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*
I)*(a + b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b
)^n) - ((3*I)*2^(-7 - 2*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((4*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((3*I)*2^(-7 - 2*n)*d^2*E^(((4*I)
*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b
*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I
*2^(-7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[
1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I
)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a +
b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 4663

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(d^(p - 1/2)*Sqrt[d + e*x^2])/Sqrt[1 - c^2*x^2], Int[(1 -
c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IGtQ[2*p, 0] &&  !(IntegerQ[p] || GtQ[d, 0])
```

Rule 4661

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[d^p/c, Subst[Int[(a + b*x)^n*Cos[x]^(2*p + 1), x], x, ArcS
in[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2
*p, 0] && (IntegerQ[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3307

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int (a+bx)^n\cos^6(x)\,dx, x, \sin^{-1}(cx)\right)}{c\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \left(\frac{5}{16}(a+bx)^n+\frac{15}{32}(a+bx)^n\cos(2x)+\frac{3}{16}(a+bx)^n \right.\right.}{c\sqrt{1-c^2x^2}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}} + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int (a+bx)^n \text{co}\right.}{32c\sqrt{1-c^2x^2}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}} + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-6ix}(a+bx\right.}{64c\sqrt{1-c^2x^2}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}} - \frac{15i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-}\right.}{}$$

Mathematica [A] time = 4.33457, size = 477, normalized size = 0.68

$$d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(9i4^{-n}e^{\frac{4ia}{b}}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{b^2}\right)^{-n}\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^n\text{Gamma}\left(n+1,\frac{4i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+i6^{-n}e^{\frac{6ia}{b}}\left(\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((120*a)/(b + b*n) + (120*ArcS
in[c*x])/(1 + n) - ((45*I)*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(2
^n*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((45*I)*E^(((2*I)*a)
/b)*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*((I*(a + b*ArcSin[c*x
]))/b)^n) - ((9*I)*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a +
b*ArcSin[c*x]))/b])/(4^n*E^(((4*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n) + (
(9*I)*E^(((4*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*
(a + b*ArcSin[c*x]))/b])/(4^n*((a + b*ArcSin[c*x])^2/b^2)^n) - (I*((I*(a +
b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*E^(
((6*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n) + (I*E^(((6*I)*a)/b)*(((-I)*(a
+ b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*((
a + b*ArcSin[c*x])^2/b^2)^n)))/(384*c*Sqrt[d - c^2*d*x^2])
```

Maple [F] time = 0.13, size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(c^4d^2x^4-2\,c^2d^2x^2+d^2\right)\sqrt{-c^2dx^2+d}\left(b\arcsin\left(cx\right)+a\right)^n,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-c^2dx^2 + d\right)^{\frac{5}{2}} (b \arcsin{(cx)} + a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n, x)
```

3.495 $\int \frac{\left(d-c^2 d x^2\right)^{5/2} \left(a+b \sin^{-1}(c x)\right)^n}{x} \, dx$

Optimal. Leaf size=826

result too large to display

```
[Out] (11*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*A
rcSin[c*x]))/b])/(16*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c
*x]))/b)^n) + (11*d^3*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(16*Sqrt[d - c^2*d*x^2]*((I*(a + b*
ArcSin[c*x]))/b)^n) - (5*3^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(32*E^(((3*I)*a)/b)*Sqrt
[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (d^3*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*3^n*
E^(((3*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (5*
3^(-1 - n)*d^3*E^(((3*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/(32*Sqrt[d - c^2*d*x^2]*((I*(a + b
*ArcSin[c*x]))/b)^n) + (d^3*E^(((3*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/(8*3^n*Sqrt[d - c^2*d
*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (5^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^n*Gamma[1 + n, ((-5*I)*(a + b*ArcSin[c*x]))/b])/(32*E^(((
5*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (5^(-1 -
 n)*d^3*E^(((5*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n
, ((5*I)*(a + b*ArcSin[c*x]))/b])/(32*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin
[c*x]))/b)^n) + d^3*Unintegrable[(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^
2]), x]
```

Rubi [A] time = 0.154542, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(d-c^2 d x^2\right)^{5/2} \left(a+b \sin^{-1}(c x)\right)^n}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] Defer[Int][((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Rubi steps

$$\int \frac{\left(d-c^2 d x^2\right)^{5/2} \left(a+b \sin^{-1}(c x)\right)^n}{x} \, dx = \int \frac{\left(d-c^2 d x^2\right)^{5/2} \left(a+b \sin^{-1}(c x)\right)^n}{x} \, dx$$

Mathematica [A] time = 0.224574, size = 0, normalized size = 0.

$$\int \frac{\left(d-c^2 d x^2\right)^{5/2} \left(a+b \sin^{-1}(c x)\right)^n}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x,x]

[Out] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [A] time = 0.161, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^n}{x}\left(-c^2dx^2+d\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x)

[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")

[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(c^4d^2x^4-2\,c^2d^2x^2+d^2\right)\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")

[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n/x,x)

[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x, x)
```

3.496 $\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$

Optimal. Leaf size=501

$$d^3\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^n}{x^2\sqrt{d-c^2dx^2}},x\right)+\frac{icd^3 2^{-n-2}e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\text{Gamma}\left(n\right.}{\sqrt{d-c^2dx^2}}$$

```
[Out] (-15*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*(1 + n)*Sqrt
[d - c^2*d*x^2]) + (I*2^(-2 - n)*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(E^(((2*I)*a)/b)*Sqrt[d -
 c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-2 - n)*c*d^3*E^(((2*
I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b
*ArcSin[c*x]))/b])/(Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I
*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(a + b*
ArcSin[c*x]))/b])/(2^(2*(3 + n))*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)
*(a + b*ArcSin[c*x]))/b)^n) - (I*c*d^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 +
 n))*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^3*Unintegrable[
(a + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]), x]
```

Rubi [A] time = 0.159583, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] Defer[Int][((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx=\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$$

Mathematica [A] time = 0.722377, size = 0, normalized size = 0.

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [A] time = 0.19, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^n}{x^2}\left(-c^2dx^2+d\right)^{\frac{5}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

```
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^n}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(c^4d^2x^4-2\,c^2d^2x^2+d^2\right)\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n/x^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n/x**2,x)
```

```
[Out] Timed out
```

<u>Giac</u> [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)^n}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

3.497 $\int \frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2], x]
```

Rubi [A] time = 0.101803, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Defer[Int][(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\int \frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A] time = 0.476862, size = 0, normalized size = 0.

$$\int \frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Integrate[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2], x]
```

Maple [A] time = 0.355, size = 0, normalized size = 0.

$$\int x^m (\arcsin(ax))^n \frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^m \arcsin(ax)^n}{a^2x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m \operatorname{asin}^n(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

3.498 $\int \frac{x^3 \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=163

$$-\frac{3\sin^{-1}(ax)^n \left(-i\sin^{-1}(ax)\right)^{-n} \text{Gamma}\left(n+1,-i\sin^{-1}(ax)\right)}{8a^4} + \frac{3^{-n-1}\sin^{-1}(ax)^n \left(-i\sin^{-1}(ax)\right)^{-n} \text{Gamma}\left(n+1,-3i\sin\right.}{8a^4}$$

```
[Out] (-3*ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(8*a^4*((-I)*ArcSin[a*x])
^n) - (3*ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(8*a^4*(I*ArcSin[a*x])^
n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (-3*I)*ArcSin[a*x]])/(8*a^4*((-
I)*ArcSin[a*x])^n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (3*I)*ArcSin[a*
x]])/(8*a^4*(I*ArcSin[a*x])^n)
```

Rubi [A] time = 0.246396, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4723, 3312, 3308, 2181}

$$-\frac{3\sin^{-1}(ax)^n \left(-i\sin^{-1}(ax)\right)^{-n} \text{Gamma}\left(n+1,-i\sin^{-1}(ax)\right)}{8a^4} + \frac{3^{-n-1}\sin^{-1}(ax)^n \left(-i\sin^{-1}(ax)\right)^{-n} \text{Gamma}\left(n+1,-3i\sin\right.}{8a^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(8*a^4*((-I)*ArcSin[a*x])
^n) - (3*ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(8*a^4*(I*ArcSin[a*x])^
n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (-3*I)*ArcSin[a*x]])/(8*a^4*((-
I)*ArcSin[a*x])^n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (3*I)*ArcSin[a*
x]])/(8*a^4*(I*ArcSin[a*x])^n)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3308

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
```

ntegerQ[m]

Rubi steps

$$\begin{aligned}\int \frac{x^3 \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx &= \frac{\text{Subst}\left(\int x^n \sin^3(x)\,dx, x, \sin^{-1}(ax)\right)}{a^4}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{4}x^n \sin(x) - \frac{1}{4}x^n \sin(3x)\right)dx, x, \sin^{-1}(ax)\right)}{a^4}\\
&= -\frac{\text{Subst}\left(\int x^n \sin(3x)\,dx, x, \sin^{-1}(ax)\right)}{4a^4} + \frac{3\,\text{Subst}\left(\int x^n \sin(x)\,dx, x, \sin^{-1}(ax)\right)}{4a^4}\\
&= -\frac{i\,\text{Subst}\left(\int e^{-3ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{8a^4} + \frac{i\,\text{Subst}\left(\int e^{3ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{8a^4} + \frac{(3i)\,\text{Subst}\left(\int e^{-ix}x\right.}{8a}\\
&= -\frac{3\left(-i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\Gamma\left(1+n,-i\sin^{-1}(ax)\right)}{8a^4} - \frac{3\left(i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\Gamma\left(1+n,i\sin\right.}{8a^4}\end{aligned}$$

Mathematica [A] time = 0.320295, size = 153, normalized size = 0.94

$$-\frac{3^{-n-1}\sin^{-1}(ax)^n\left(\sin^{-1}(ax)^2\right)^{-2n}\left(\left(-i\sin^{-1}(ax)\right)^n\left(3^{n+2}\left(\sin^{-1}(ax)^2\right)^n\text{Gamma}\left(n+1,i\sin^{-1}(ax)\right)-\left(\sin^{-1}(ax)^2\right)^n\text{G}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -(3^(-1 - n)*ArcSin[a*x]^n*(3^(2 + n)*(I*ArcSin[a*x])^n*(ArcSin[a*x]^2)^n*G
amma[1 + n, (-I)*ArcSin[a*x]] + ((-I)*ArcSin[a*x])^n*(3^(2 + n)*(ArcSin[a*x
]^2)^n*Gamma[1 + n, I*ArcSin[a*x]] - (I*ArcSin[a*x])^(2*n)*Gamma[1 + n, (-3
*I)*ArcSin[a*x]] - (ArcSin[a*x]^2)^n*Gamma[1 + n, (3*I)*ArcSin[a*x]])))/(8*
a^4*(ArcSin[a*x]^2)^(2*n))
```

Maple [F] time = 0.248, size = 0, normalized size = 0.

$$\int x^3\left(\arcsin(ax)\right)^n\frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^3\arcsin{(ax)}^n}{a^2x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^3*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3\operatorname{asin}^n{(ax)}}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3\arcsin{(ax)}^n}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^3*arcsin(a*x)^n/sqrt(-a^2*x^2 + 1), x)
```

3.499 $\int \frac{x^2 \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=109

$$\frac{i2^{-n-3}\sin^{-1}(ax)^n\left(-i\sin^{-1}(ax)\right)^{-n}\text{Gamma}\left(n+1,-2i\sin^{-1}(ax)\right)}{a^3}-\frac{i2^{-n-3}\left(i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\text{Gamma}\left(n+1,\right.}{a^3}$$

```
[Out] ArcSin[a*x]^(1 + n)/(2*a^3*(1 + n)) + (I*2^(-3 - n)*ArcSin[a*x]^n*Gamma[1 +
 n, (-2*I)*ArcSin[a*x]])/(a^3*((-I)*ArcSin[a*x])^n) - (I*2^(-3 - n)*ArcSin[
a*x]^n*Gamma[1 + n, (2*I)*ArcSin[a*x]])/(a^3*(I*ArcSin[a*x])^n)
```

Rubi [A] time = 0.20733, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4723, 3312, 3307, 2181}

$$\frac{i2^{-n-3}\sin^{-1}(ax)^n\left(-i\sin^{-1}(ax)\right)^{-n}\text{Gamma}\left(n+1,-2i\sin^{-1}(ax)\right)}{a^3}-\frac{i2^{-n-3}\left(i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\text{Gamma}\left(n+1,\right.}{a^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(2*a^3*(1 + n)) + (I*2^(-3 - n)*ArcSin[a*x]^n*Gamma[1 +
 n, (-2*I)*ArcSin[a*x]])/(a^3*((-I)*ArcSin[a*x])^n) - (I*2^(-3 - n)*ArcSin[
a*x]^n*Gamma[1 + n, (2*I)*ArcSin[a*x]])/(a^3*(I*ArcSin[a*x])^n)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3307

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int \frac{x^2 \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \frac{\text{Subst}\left(\int x^n \sin^2(x)\,dx, x, \sin^{-1}(ax)\right)}{a^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{x^n}{2} - \frac{1}{2}x^n\cos(2x)\right)dx, x, \sin^{-1}(ax)\right)}{a^3}$$
$$= \frac{\sin^{-1}(ax)^{1+n}}{2a^3(1+n)} - \frac{\text{Subst}\left(\int x^n\cos(2x)\,dx, x, \sin^{-1}(ax)\right)}{2a^3}$$
$$= \frac{\sin^{-1}(ax)^{1+n}}{2a^3(1+n)} - \frac{\text{Subst}\left(\int e^{-2ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{4a^3} - \frac{\text{Subst}\left(\int e^{2ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{4a^3}$$
$$= \frac{\sin^{-1}(ax)^{1+n}}{2a^3(1+n)} + \frac{i2^{-3-n}\left(-i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\Gamma\left(1+n,-2i\sin^{-1}(ax)\right)}{a^3} - \frac{i2^{-3-n}\left(i\sin^{-1}(ax)\right)^{-n}}{}$$

Mathematica [A] time = 0.253703, size = 109, normalized size = 1.

$$\frac{2^{-n-3}\sin^{-1}(ax)^n\left(\sin^{-1}(ax)^2\right)^{-n}\left(-i(n+1)\left(-i\sin^{-1}(ax)\right)^n\text{Gamma}\left(n+1,2i\sin^{-1}(ax)\right)+i(n+1)\left(i\sin^{-1}(ax)\right)^n\text{Gamma}\right.}{a^3(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2^(-3 - n)*ArcSin[a*x]^n*(2^(2 + n)*ArcSin[a*x]*(ArcSin[a*x]^2)^n + I*(1 +
 n)*(I*ArcSin[a*x])^n*Gamma[1 + n, (-2*I)*ArcSin[a*x]] - I*(1 + n)*((-I)*Ar
cSin[a*x])^n*Gamma[1 + n, (2*I)*ArcSin[a*x]]))/(a^3*(1 + n)*(ArcSin[a*x]^2)
^n)
```

Maple [F] time = 0.217, size = 0, normalized size = 0.

$$\int x^2 (\arcsin(ax))^n \frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x^2\arcsin(ax)^n}{a^2x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2\,\text{asin}^n(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2\arcsin(ax)^n}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^2*arcsin(a*x)^n/sqrt(-a^2*x^2 + 1), x)
```

3.500 $\int \frac{x \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}} \, dx$

Optimal. Leaf size=75

$$-\frac{\sin^{-1}(ax)^n \left(-i\sin^{-1}(ax)\right)^{-n} \text{Gamma}\left(n+1,-i\sin^{-1}(ax)\right)}{2a^2}-\frac{\left(i\sin^{-1}(ax)\right)^{-n} \sin^{-1}(ax)^n \text{Gamma}\left(n+1,i\sin^{-1}(ax)\right)}{2a^2}$$

```
[Out] -(ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(2*a^2*((-I)*ArcSin[a*x])^n
) - (ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(2*a^2*(I*ArcSin[a*x])^n)
```

Rubi [A] time = 0.115914, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4723, 3308, 2181}

$$-\frac{\sin^{-1}(ax)^n \left(-i\sin^{-1}(ax)\right)^{-n} \text{Gamma}\left(n+1,-i\sin^{-1}(ax)\right)}{2a^2}-\frac{\left(i\sin^{-1}(ax)\right)^{-n} \sin^{-1}(ax)^n \text{Gamma}\left(n+1,i\sin^{-1}(ax)\right)}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -(ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(2*a^2*((-I)*ArcSin[a*x])^n
) - (ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(2*a^2*(I*ArcSin[a*x])^n)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3308

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{x \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}} \, dx &= \frac{\text{Subst}\left(\int x^n \sin(x) \, dx, x, \sin^{-1}(ax)\right)}{a^2}\\
&= \frac{i \,\text{Subst}\left(\int e^{-ix} x^n \, dx, x, \sin^{-1}(ax)\right)}{2a^2}-\frac{i \,\text{Subst}\left(\int e^{ix} x^n \, dx, x, \sin^{-1}(ax)\right)}{2a^2}\\
&= -\frac{\left(-i\sin^{-1}(ax)\right)^{-n} \sin^{-1}(ax)^n \Gamma\left(1+n,-i\sin^{-1}(ax)\right)}{2a^2}-\frac{\left(i\sin^{-1}(ax)\right)^{-n} \sin^{-1}(ax)^n \Gamma\left(1+n,i\sin^{-1}(ax\right)}{2a^2}
\end{aligned}$$

Mathematica [A] time = 0.074226, size = 70, normalized size = 0.93

$$-\frac{\sin^{-1}(ax)^n \left(\sin^{-1}(ax)^2\right)^{-n} \left(\left(-i\sin^{-1}(ax)\right)^n \text{Gamma}\left(n+1, i\sin^{-1}(ax)\right) + \left(i\sin^{-1}(ax)\right)^n \text{Gamma}\left(n+1, -i\sin^{-1}(ax\right.\right.}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -(ArcSin[a*x]^n*((I*ArcSin[a*x])^n*Gamma[1 + n, (-I)*ArcSin[a*x]] + ((-I)*A
rcSin[a*x])^n*Gamma[1 + n, I*ArcSin[a*x]]))/(2*a^2*(ArcSin[a*x]^2)^n)
```

Maple [F] time = 0.097, size = 0, normalized size = 0.

$$\int x (\arcsin(ax))^n \frac{1}{\sqrt{-a^2x^2+1}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}x \arcsin(ax)^n}{a^2x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \operatorname{asin}^n(ax)}{\sqrt{-(ax-1)(ax+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \arcsin(ax)^n}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x*arcsin(a*x)^n/sqrt(-a^2*x^2 + 1), x)
```

3.501 $\int \frac{\sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=17

$$\frac{\sin^{-1}(ax)^{n+1}}{a(n+1)}$$

```
[Out] ArcSin[a*x]^(1 + n)/(a*(1 + n))
```

Rubi [A] time = 0.0363865, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4641}

$$\frac{\sin^{-1}(ax)^{n+1}}{a(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^n/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(a*(1 + n))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \frac{\sin^{-1}(ax)^{1+n}}{a(1+n)}$$

Mathematica [A] time = 0.0066565, size = 17, normalized size = 1.

$$\frac{\sin^{-1}(ax)^{n+1}}{a(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^n/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(a*(1 + n))
```

Maple [A] time = 0.003, size = 18, normalized size = 1.1

$$\frac{(\arcsin(ax))^{1+n}}{a(1+n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] arcsin(a*x)^(1+n)/a/(1+n)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.0873, size = 50, normalized size = 2.94

$$\frac{\arcsin\left(ax\right)^{n}\arcsin\left(ax\right)}{an+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] arcsin(a*x)^n*arcsin(a*x)/(a*n + a)
```

Sympy [A] time = 1.03935, size = 34, normalized size = 2.

$$\begin{cases} \tilde{\infty}x & \text{for}\ a = 0 \wedge n = -1 \\ 0^{n}x & \text{for}\ a = 0 \\ \frac{\log\left(\operatorname{asin}\left(ax\right)\right)}{a} & \text{for}\ n = -1 \\ \frac{\operatorname{asin}\left(ax\right)\operatorname{asin}^{n}\left(ax\right)}{an+a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((zoo*x, Eq(a, 0) & Eq(n, -1)), (0**n*x, Eq(a, 0)), (log(asin(a*x)
)/a, Eq(n, -1)), (asin(a*x)*asin(a*x)**n/(a*n + a), True))
```

Giac [A] time = 1.2354, size = 23, normalized size = 1.35

$$\frac{\arcsin\left(ax\right)^{n+1}}{a(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] arcsin(a*x)^(n + 1)/(a*(n + 1))
```

3.502 $\int \frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]), x]
```

Rubi [A] time = 0.102011, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] Defer[Int][ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]), x]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx=\int \frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A] time = 3.21892, size = 0, normalized size = 0.

$$\int \frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] Integrate[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]), x]
```

Maple [A] time = 0.099, size = 0, normalized size = 0.

$$\int \frac{(\arcsin(ax))^n}{x}\frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^n}{a^2x^3-x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^n/(a^2*x^3 - x), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{asin}^n(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**n/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**n/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\arcsin(ax)^n}{\sqrt{-a^2x^2+1}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^n/(sqrt(-a^2*x^2 + 1)*x), x)
```

3.503 $\int \frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]), x]
```

Rubi [A] time = 0.101614, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] Defer[Int][ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]), x]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A] time = 0.93575, size = 0, normalized size = 0.

$$\int \frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] Integrate[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]), x]
```

Maple [A] time = 0.127, size = 0, normalized size = 0.

$$\int \frac{(\arcsin(ax))^n}{x^2}\frac{1}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{-a^2x^2+1}\arcsin(ax)^n}{a^2x^4-x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^n/(a^2*x^4 - x^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{asin}^n(ax)}{x^2\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**n/x**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**n/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\arcsin(ax)^n}{\sqrt{-a^2x^2+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^n/(sqrt(-a^2*x^2 + 1)*x^2), x)
```

3.504 $\int (d+cdx)^{5/2}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=376

$$\frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)+\frac{5d^2\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\sqrt{1-c^2x^2}}-\frac{2d^2\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{\ldots}}{3c\ldots}$$

```
[Out] (2*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c*
d^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) - (2*b*c^2*
d^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2
*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*d^2*x*Sqr
t[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*d^2*x^3*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 - (2*d^2*Sqrt[d + c*d*x]*Sqr
t[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*d^2*Sqrt[d + c*d
*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.536966, antiderivative size = 376, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 4763, 4647, 4641, 30, 4677, 4697, 4707}

$$\frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)+\frac{5d^2\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\sqrt{1-c^2x^2}}-\frac{2d^2\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{\ldots}}{3c\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c*
d^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) - (2*b*c^2*
d^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2
*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*d^2*x*Sqr
t[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*d^2*x^3*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 - (2*d^2*Sqrt[d + c*d*x]*Sqr
t[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*d^2*Sqrt[d + c*d
*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
```

```
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rubi steps

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)dx = \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (d+cdx)^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \left(d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+2cd^2x\sqrt{1-c^2 \cdots\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}} + \frac{\left(2cd^2\sqrt{d+ \cdots\right.}{\cdots}$$

$$= \frac{1}{2}d^2x\sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{f-cf \cdots}$$

$$= \frac{2bd^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcd^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} - \frac{2bc^2d^2x^3\sqrt{d \cdots}}{9\sqrt{1 \cdots}}$$

$$= \frac{2bd^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} - \frac{2bc^2d^2x^3\sqrt{d \cdots}}{9\sqrt{\cdots}}$$

Mathematica [A] time = 1.23363, size = 293, normalized size = 0.78

$$\frac{d^2\sqrt{cdx+d}\sqrt{f-cfx}\left(48a\sqrt{1-c^2x^2}\left(6c^3x^3+16c^2x^2+9cx-16\right)-256bcx\left(c^2x^2-3\right)+144b\cos\left(2\sin^{-1}(cx)\right)-9b\cos \cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (360*b*d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*d^(5/2)*Sq
rt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] + d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-256*b*c
*x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(-16 + 9*c*x + 16*c^2*x^2 + 6*c^
3*x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) + 12*b*d^2*Sqrt
[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) + 24*Sin[2
*ArcSin[c*x]] - 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.338, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{5}{2}}\left(a+b\arcsin(cx)\right)\sqrt{-cfx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^2d^2x^2 + 2\,acd^2x + ad^2 + \left(bc^2d^2x^2 + 2\,bcd^2x + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cfx + f}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2*
x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(cdx + d\right)^{\frac{5}{2}}\sqrt{-cfx + f}\left(b\arcsin\left(cx\right) + a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

3.505 $\int (d+cdx)^{3/2}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=273

$$\frac{d\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}-\frac{d\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{1}{2}dx\sqrt{cdx+d}\sqrt{f-cfx}\,($$

```
[Out] (b*d*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*
Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) - (b*c^2*d*x^3*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 - (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x
]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.296695, antiderivative size = 273, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4673, 4763, 4647, 4641, 30, 4677}

$$\frac{d\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}-\frac{d\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{1}{2}dx\sqrt{cdx+d}\sqrt{f-cfx}\,($$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*d*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*
Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) - (b*c^2*d*x^3*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 - (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x
]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rubi steps

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)dx = \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (d+cdx)\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \left(d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+cdx\sqrt{1-c^2x^2}\left(a+\right.\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}} + \frac{\left(cd\sqrt{d+cdx}\sqrt{\right.}{}$$

$$= \frac{1}{2}dx\sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right) - \frac{d\sqrt{d+cdx}\sqrt{f-cfx}\left(1-c^2x^2\right.}{3c}$$

$$= \frac{bdx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcdx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} - \frac{bc^2dx^3\sqrt{d+cdx}\sqrt{f}}{9\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 0.943836, size = 260, normalized size = 0.95

$$\frac{d\sqrt{cdx+d}\sqrt{f-cfx}\left(12a\sqrt{1-c^2x^2}\left(2c^2x^2+3cx-2\right)-8bcx\left(c^2x^2-3\right)+9b\cos\left(2\sin^{-1}(cx)\right)\right)-36ad^{3/2}\sqrt{f}\sqrt{1-c^2x^2}\,\mathrm{ta}}{72}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (18*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*d^(3/2)*Sqrt[f
]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*S
qrt[f]*(-1 + c^2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-8*b*c*x*(-3 +
 c^2*x^2) + 12*a*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x + 2*c^2*x^2) + 9*b*Cos[2*Arc
Sin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-4*(1 - c^2
*x^2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.232, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}} (a+b\arcsin(cx)) \sqrt{-cfx+f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left((acdx+ad+(bcdx+bd)\arcsin(cx))\sqrt{cdx+d}\sqrt{-cfx+f}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt
(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}} \sqrt{-cfx+f}(b\arcsin(cx)+a)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

3.506 $\int \sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=134

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)-\frac{bcx^2\sqrt{cdx+d}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}$$

```
[Out] -(b*c*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) + (x*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.16526, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {4673, 4647, 4641, 30}

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)-\frac{bcx^2\sqrt{cdx+d}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(b*c*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) + (x*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)dx = \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}x\sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right) + \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \frac{a+b\sin^{-1}(c}{\sqrt{1-c^2x^2}}}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right) + \frac{\sqrt{d+}}{}$$

Mathematica [A] time = 0.933247, size = 158, normalized size = 1.18

$$\frac{1}{8}\left(-\frac{4a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(c^2x^2-1)}\right)}{c} + 4ax\sqrt{cdx+d}\sqrt{f-cfx} + \frac{b\sqrt{cdx+d}\sqrt{f-cfx}\left(2\sin^{-1}(cx)\left(\sin^{-1}(cx)+\sin\left(2\sin\right.\right.\right.}{c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (4*a*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x] - (4*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*S
qrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))])/c + (b*S
qrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[
c*x] + Sin[2*ArcSin[c*x]])))/(c*Sqrt[1 - c^2*x^2]))/8
```

Maple [F] time = 0.237, size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\,(a+b\arcsin(cx))\sqrt{-cfx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin(cx)+a), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{d\left(cx+1\right)}\sqrt{-f\left(cx-1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))*(a + b*asin(c*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin\left(cx\right)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

3.507 $\int \frac{\sqrt{f-cfx}(a+b\sin^{-1}(cx))}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=141

$$\frac{f\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{f(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{c\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[Out] -((b*f*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x])) + (f*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (f*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rubi [A] time = 0.263936, antiderivative size = 141, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4673, 4763, 4641, 4677, 8}

$$\frac{f\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{f(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{c\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] -((b*f*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x])) + (f*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (f*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
```

```
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{cfx\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\left(f\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(cf\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{f\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(bf\sqrt{1-c^2x^2}\right)\int}{\sqrt{d+cdx}\sqrt{f-}}$$

$$= -\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{2bc\sqrt{d+cdx}\sqrt{f-cf}}$$

Mathematica [A] time = 0.785273, size = 200, normalized size = 1.42

$$\frac{\frac{2\sqrt{cdx+d}\sqrt{f-cfx}\left(a\sqrt{1-c^2x^2}-bcx\right)}{\sqrt{1-c^2x^2}} - 2a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right) + \frac{b\sqrt{cdx+d}\sqrt{f-cfx}\sin^{-1}(cx)^2}{\sqrt{1-c^2x^2}} + 2b\sqrt{cdx+d}\sqrt{f-cfx}\sin^{-1}(c}{2cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] ((2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-(b*c*x) + a*Sqrt[1 - c^2*x^2]))/Sqrt[
1 - c^2*x^2] + 2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x] + (b*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 2*a*Sqrt[d]*Sqr
t[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^
2*x^2))])/(2*c*d)
```

Maple [F] time = 0.243, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\sqrt{-cfx+f}\frac{1}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{-cfx+f}(b\arcsin(cx)+a)}{\sqrt{cdx+d}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-f(cx-1)}\,(a+b\operatorname{asin}(cx))}{\sqrt{d(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(1/2),x)
```

```
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/sqrt(d*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-cfx+f}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

3.508 $\int \frac{\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=162

$$-\frac{f^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2bf^2\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] (-2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(
f - c*f*x)^(3/2)) - (f^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*f^2*(1 - c^2*x^2)^(3/2)*Log[1 +
 c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.360423, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 4775, 637, 4761, 12, 627, 31, 4641}

$$-\frac{f^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2bf^2\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (-2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(
f - c*f*x)^(3/2)) - (f^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*f^2*(1 - c^2*x^2)^(3/2)*Log[1 +
 c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
```

```
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(f-cfx)^2\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{2\left(f^2-cf^2x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}-\frac{f^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(f^2-cf^2x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(f^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{(2bc\ldots}{\ldots}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{(2b\ldots}{\ldots}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{(2b\ldots}{(\ldots}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2bf\ldots}{c(\ldots}$$

Mathematica [A] time = 1.32478, size = 248, normalized size = 1.53

$$-\frac{-2a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right)+\frac{4a\sqrt{cdx+d}\sqrt{f-cfx}}{cx+1}+\frac{b\sqrt{cdx+d}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\left(\sin^{-1}(cx)\left(\sin^{-1}(cx)+4\right)-8\log\left(\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)+\ldots\right.\right.\right.}{\sqrt{1-c^2x^2}\left(\sin\ldots\right.}}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] -((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x) - 2*a*Sqrt[d]*Sqrt[f]*Arc
Tan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))]
 + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*(4 +
 ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4 + Ar
cSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Si
n[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2])))/(2*c*d^2)
```

Maple [F] time = 0.285, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))\sqrt{-cfx + f}\,(cdx + d)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{cdx + d}\sqrt{-cfx + f}(b \arcsin (cx) + a)}{c^2d^2x^2 + 2\,cd^2x + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d^2*x^2
 + 2*c*d^2*x + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-f\,(cx - 1)}\,(a + b \operatorname{asin}(cx))}{(d\,(cx + 1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(3/2),x)
```

```
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/(d*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-cfx + f}(b\arcsin(cx) + a)}{(cdx + d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

3.509 $\int \frac{\sqrt{f-cfx}(a+b\sin^{-1}(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=163

$$-\frac{f^3(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2bf^3\left(1-c^2x^2\right)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^3\left(1-c^2x^2\right)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] (-2*b*f^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (f^3*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*f^3*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.269134, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4673, 651, 4761, 12, 627, 43}

$$-\frac{f^3(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2bf^3\left(1-c^2x^2\right)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^3\left(1-c^2x^2\right)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (-2*b*f^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (f^3*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*f^3*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 651

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^m*(a + c*x^2)^(p + 1))/(2*c*d*(p + 1)), x] /; FreeQ[{a, c, d,
e, m, p}, x] && EqQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p] && EqQ[m + 2*p + 2,
0]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc\left(1-c^2x^2\right)^{5/2}\right)\int -\frac{f^3(1-cx)^3}{3c\left(1-c^2x^2\right)^2}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{(1-cx)^3}{\left(1-c^2x^2\right)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{1-cx}{(1+cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3\left(1-c^2x^2\right)^{5/2}\right)\int \left(\frac{1}{-1-cx}+\frac{2}{(1+cx)^2}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2bf^3\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f^3(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bf^3}{3c}$$

Mathematica [A] time = 0.482913, size = 114, normalized size = 0.7

$$-\frac{f\sqrt{cdx+d}\left((cx-1)\left(acx-a-b\sqrt{1-c^2x^2}\right)+b(cx+1)\sqrt{1-c^2x^2}\log(-f(cx+1))+b(cx-1)^2\sin^{-1}(cx)\right)}{3cd^3(cx+1)^2\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] -(f*Sqrt[d + c*d*x]*((-1 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b*(-1
+ c*x)^2*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))]))/
(3*c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F] time = 0.239, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\sqrt{-cfx+f}\,(cdx+d)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.81672, size = 1137, normalized size = 6.98

$$\left[\frac{\left(bc^3dx^3 + bc^2dx^2 - bcdx - bd\right)\sqrt{\frac{f}{d}}\log\left(\frac{c^6fx^6+4c^5fx^5+5c^4fx^4-4c^2fx^2-4cfx+\left(c^4x^4+4c^3x^3+6c^2x^2+4cx\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{\frac{f}{d}}-2}{c^4x^4+2c^3x^3-2cx-1}\right.}{6\left(c^4d^3x^3+c^3d^3x^2-c^2d^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(f/d)*log((c^6*f*x^6
+ 4*c^5*f*x^5 + 5*c^4*f*x^4 - 4*c^2*f*x^2 - 4*c*f*x + (c^4*x^4 + 4*c^3*x^3
+ 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sq
rt(f/d) - 2*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) + 2*(a*c^2*x^2 - 2*sqrt(-
c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*arcsin(c*x) + a)*s
qrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x^2 - c^2*d^3*x - c
*d^3), -1/3*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(-f/d)*arctan(
(c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*s
qrt(-f/d)/(c^4*f*x^4 + 2*c^3*f*x^3 - c^2*f*x^2 - 2*c*f*x)) - (a*c^2*x^2 - 2
*sqrt(-c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*arcsin(c*x)
 + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x^2 - c^2*d^
3*x - c*d^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-cfx + f}(b \arcsin(cx) + a)}{(cdx + d)^{\frac{5}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

3.510 $\int (d+cdx)^{5/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=414

$$\frac{3dx(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8\left(1-c^2x^2\right)}+\frac{3d(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\left(1-c^2x^2\right)^{3/2}}-\frac{d\left(1-c^2x^2\right)(cdx+d)^{3/}}{}$$

```
[Out] (b*d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(5*(1 - c^2*x^2)^(3/2)) - (5*b*
c*d*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) - (2*
b*c^2*d*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*d*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2))
 + (b*c^4*d*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/2
)) + (d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2
)) - (d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x
]))/(5*c) + (3*d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)
/(16*b*c*(1 - c^2*x^2)^(3/2))
```

Rubi [A] time = 0.389728, antiderivative size = 414, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4673, 4763, 4649, 4647, 4641, 30, 14, 4677, 194}

$$\frac{3dx(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8\left(1-c^2x^2\right)}+\frac{3d(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\left(1-c^2x^2\right)^{3/2}}-\frac{d\left(1-c^2x^2\right)(cdx+d)^{3/}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(5*(1 - c^2*x^2)^(3/2)) - (5*b*
c*d*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) - (2*
b*c^2*d*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*d*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2))
 + (b*c^4*d*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/2
)) + (d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2
)) - (d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x
]))/(5*c) + (3*d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)
/(16*b*c*(1 - c^2*x^2)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
```

```
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int (d+cdx)\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(d\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+cdx\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left(d(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx}{\left(1-c^2x^2\right)^{3/2}} +$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{d(d+cdx)^{3/2}(f-cf}{}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right) + \frac{3dx(d+cdx)^{3/2}(f-}{8(1}$$

$$= \frac{bdx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}} - \frac{5bcdx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} - \frac{2bc^2}{}$$

Mathematica [A] time = 1.52268, size = 305, normalized size = 0.74

$$\frac{d^2f\left(\sqrt{cdx+d}\sqrt{f-cfx}\left(-240a\sqrt{1-c^2x^2}\left(8c^4x^4+10c^3x^3-16c^2x^2-25cx+8\right)+128bcx\left(3c^4x^4-10c^2x^2+15\right)+12\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*f*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(128*b*c
*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) - 240*a*Sqrt[1 - c^2*x^2]*(8 - 25*c*x - 16
*c^2*x^2 + 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b*Cos[4
*ArcSin[c*x]]) - 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(32*(1 -
c^2*x^2)^(5/2) - 40*Sin[2*ArcSin[c*x]] - 5*Sin[4*ArcSin[c*x]])))/(9600*c*Sq
rt[1 - c^2*x^2])
```

Maple [F] time = 0.224, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{5}{2}}\left(-cfx+f\right)^{\frac{3}{2}}\left(a+b\arcsin(cx)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(ac^3d^2fx^3 + ac^2d^2fx^2 - acd^2fx - ad^2f + \left(bc^3d^2fx^3 + bc^2d^2fx^2 - bcd^2fx - bd^2f\right)\arcsin(cx)\right)\sqrt{cdx + d}\sqrt{-c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^3*d^2*f*x^3 + a*c^2*d^2*f*x^2 - a*c*d^2*f*x - a*d^2*f + (b*c
^3*d^2*f*x^3 + b*c^2*d^2*f*x^2 - b*c*d^2*f*x - b*d^2*f)*arcsin(c*x))*sqrt(c
*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{5}{2}}\left(-cfx + f\right)^{\frac{3}{2}}(b\arcsin(cx) + a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

3.511 $\int (d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=226

$$\frac{3x(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8\left(1-c^2x^2\right)}+\frac{3(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\left(1-c^2x^2\right)^{3/2}}+\frac{1}{4}x(cdx+d)^{3/2}(f-cfx)^{3}$$

```
[Out] (-5*b*c*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*x*(d +
c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)) + (3*
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(16*b*c*(1 - c^2
*x^2)^(3/2))
```

Rubi [A] time = 0.223822, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4673, 4649, 4647, 4641, 30, 14}

$$\frac{3x(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8\left(1-c^2x^2\right)}+\frac{3(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\left(1-c^2x^2\right)^{3/2}}+\frac{1}{4}x(cdx+d)^{3/2}(f-cfx)^{3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (-5*b*c*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*x*(d +
c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)) + (3*
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(16*b*c*(1 - c^2
*x^2)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
```

```
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)dx = \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right) + \frac{\left(3(d+cdx)^{3/2}(f-cfx)^{3/}\right.}{4}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right) + \frac{3x(d+cdx)^{3/2}(f-cfx)^{3/}}{8\left(1-c^2\right.}$$

$$= -\frac{5bcx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{bc^3x^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{1}{4}x(d$$

Mathematica [A] time = 1.04365, size = 247, normalized size = 1.09

$$df\sqrt{cdx+d}\sqrt{f-cfx}\left(16acx\sqrt{1-c^2x^2}\left(5-2c^2x^2\right)+16b\cos\left(2\sin^{-1}(cx)\right)+b\cos\left(4\sin^{-1}(cx)\right)\right)-48ad^{3/2}f^{3/2}\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*b*d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 48*a*d^(3/2)*f^(3
/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]
*Sqrt[f]*(-1 + c^2*x^2))] + d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*a*c*x*(
5 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin
[c*x]]) + 4*b*d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(8*Sin[2*ArcS
in[c*x]] + Sin[4*ArcSin[c*x]]))/(128*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.224, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}} \left(-cfx+f\right)^{\frac{3}{2}} (a+b\arcsin(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\left(ac^2dfx^2-adf+\left(bc^2dfx^2-bdf\right)\arcsin(cx)\right)\sqrt{cdx+d}\sqrt{-cfx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d*f*x^2 - a*d*f + (b*c^2*d*f*x^2 - b*d*f)*arcsin(c*x))*sqr
t(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}} \left(-cfx+f\right)^{\frac{3}{2}} (b\arcsin(cx)+a)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

3.512 $\int \sqrt{d+cdx}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=273

$$\frac{f\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}+\frac{f\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{1}{2}fx\sqrt{cdx+d}\sqrt{f-cfx}$$

```
[Out] -(b*f*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*f*x^2
*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) + (b*c^2*f*x^3*Sqrt
[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (f*x*Sqrt[d + c*d*x]*S
qrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*
(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*
x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.311758, antiderivative size = 273, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4673, 4763, 4647, 4641, 30, 4677}

$$\frac{f\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{1-c^2x^2}}+\frac{f\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{1}{2}fx\sqrt{cdx+d}\sqrt{f-cfx}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] -(b*f*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*f*x^2
*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) + (b*c^2*f*x^3*Sqrt
[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (f*x*Sqrt[d + c*d*x]*S
qrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*
(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*
x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)dx = \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (f-cfx)\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \left(f\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-cfx\sqrt{1-c^2x^2}\left(a\right.\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(f\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}} - \frac{\left(cf\sqrt{d+cdx}\right.}{}$$

$$= \frac{1}{2}fx\sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right) + \frac{f\sqrt{d+cdx}\sqrt{f-cfx}\left(1-c^2x^2\right.}{3c}$$

$$= -\frac{bfx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{bc^2fx^3\sqrt{d+cdx}}{9\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 1.0032, size = 260, normalized size = 0.95

$$\frac{f\sqrt{cdx+d}\sqrt{f-cfx}\left(12a\sqrt{1-c^2x^2}\left(-2c^2x^2+3cx+2\right)+8bcx\left(c^2x^2-3\right)+9b\cos\left(2\sin^{-1}(cx)\right)\right)-36a\sqrt{d}f^{3/2}\sqrt{1-c^2x^2}}{7}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (18*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*Sqrt[d]*f^(3/2
)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*S
qrt[f]*(-1 + c^2*x^2))] + f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(12*a*(2 + 3*c*
x - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c*x*(-3 + c^2*x^2) + 9*b*Cos[2*ArcSi
n[c*x]]) + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(4*(1 - c^2*x^
2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.236, size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\left(-cfx+f\right)^{\frac{3}{2}} \left(a+b \arcsin \left(cx\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(acfx-af+\left(bcfx-bf\right)\arcsin\left(cx\right)\right)\sqrt{cdx+d}\sqrt{-cfx+f}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\left(-cfx+f\right)^{\frac{3}{2}}\left(b \arcsin \left(cx\right)+a\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

3.513 $\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=242

$$\frac{3f^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{f^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{2f^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{bcf^2x^2\sqrt{1-}}{4\sqrt{cdx+d}\sqrt{}}$$

```
[Out] (-2*b*f^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*f^2
*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (2*f^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (f^2*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*
f^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x])
```

Rubi [A] time = 0.425293, antiderivative size = 242, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4673, 4763, 4641, 4677, 8, 4707, 30}

$$\frac{3f^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{f^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{2f^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{bcf^2x^2\sqrt{1-}}{4\sqrt{cdx+d}\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-2*b*f^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*f^2
*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (2*f^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (f^2*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*
f^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{2cf^2x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{c^2f^2x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\left(f^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(2cf^2\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(c^2f^2\sqrt{1-\right.}{\sqrt{}}$$

$$= \frac{2f^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{f^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f^2\sqrt{1-c^2x^2}\,(}{2bc\sqrt{d+}}$$

$$= -\frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{2f^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} - $$

Mathematica [A] time = 1.22425, size = 238, normalized size = 0.98

$$\frac{-f\sqrt{cdx+d}\sqrt{f-cfx}\left(4a(cx-4)\sqrt{1-c^2x^2}+16bcx+b\cos\left(2\sin^{-1}(cx)\right)\right)-12a\sqrt{d}f^{3/2}\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right)}{8cd\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-4*b*f*(-4 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*ArcSin
[c*x] + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 12*a*Sqrt[d]*
f^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqr
t[d]*Sqrt[f]*(-1 + c^2*x^2))] - f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*b*c*x
 + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]))/(8*c*d*Sqrt[1
- c^2*x^2])
```

Maple [F] time = 0.23, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(-cfx+f\right)^{\frac{3}{2}}\frac{1}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{\left(acfx-af+\left(bcfx-bf\right)\arcsin(cx)\right)\sqrt{-cfx+f}}{\sqrt{cdx+d}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(-c*f*x + f)/sq
rt(c*d*x + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-cfx+f\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

3.514 $\int \frac{(f-cfx)^{3/2}(a+b\sin^{-1}(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=252

$$-\frac{3f^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{f^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{}{(c}$$

```
[Out] (b*f^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (4*f^
3*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c*
f*x)^(3/2)) - (f^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (3*f^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2
*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*f^3*(1 - c^2*x^2)^(3/2)*Lo
g[1 + c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.436466, antiderivative size = 252, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4673, 4775, 637, 4761, 12, 627, 31, 4641, 4677, 8}

$$-\frac{3f^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{f^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{}{(c}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (b*f^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (4*f^
3*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c*
f*x)^(3/2)) - (f^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (3*f^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2
*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*f^3*(1 - c^2*x^2)^(3/2)*Lo
g[1 + c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}}dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(f-cfx)^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$
$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{4\left(f^3-cf^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}} - \frac{3f^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{cf^3x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$
$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(f^3-cf^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(3f^3\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}d}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$
$$= -\frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - 3$$
$$= \frac{bf^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3\left(1-c^2x\right.}{c(d+c}$$
$$= \frac{bf^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3\left(1-c^2x\right.}{c(d+c}$$
$$= \frac{bf^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3\left(1-c^2x\right.}{c(d+c}$$

Mathematica [A] time = 3.15703, size = 291, normalized size = 1.15

$$\frac{f\left(6a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right) - \frac{\sqrt{cdx+d}\sqrt{f-cfx}\csc^2\left(\frac{1}{2}\sin^{-1}(cx)\right)\left(2\left(a(cx+5)\left(\sqrt{1-c^2x^2}+cx-1\right)+bcx\left(\sqrt{1-c^2x^2}-cx-1\right)+8b\left(\sqrt{1-c^2x^2}-cx-1\right.\right.\right.}{2\sqrt{1-c^2x^2}\left(\right.}}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (f*(6*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] - (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Csc[ArcSin[c
*x]/2]^2*(2*b*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 3*b*(-
1 - c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*(b*c*x*(-1 - c*x + Sqrt[1 -
c^2*x^2]) + a*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2]) + 8*b*(-1 - c*x + Sq
rt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])))/(2*Sqrt[1
- c^2*x^2]*(1 + Cot[ArcSin[c*x]/2]))))/(2*c*d^2)
```

Maple [F] time = 0.238, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(-cfx+f\right)^{\frac{3}{2}}(cdx+d)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(acfx - af + \left(bcfx - bf\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cfx + f}}{c^2d^2x^2 + 2\,cd^2x + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-cfx + f\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)}{\left(cdx + d\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

3.515 $\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=324

$$\frac{2f^4(1-cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{f^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)\left(a+b\right.}{c(cdx+d)^{5/2}(f-cfx)}$$

```
[Out] (-4*b*f^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*f^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (2*f^4*(1 - c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (f^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*f^4*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.353152, antiderivative size = 324, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4673, 669, 653, 216, 4761, 627, 43, 31, 4641}

$$\frac{2f^4(1-cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{f^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)\left(a+b\right.}{c(cdx+d)^{5/2}(f-cfx)}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```


```
[Out] (-4*b*f^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*f^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (2*f^4*(1 - c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (f^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*f^4*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 669

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(m +
p))/(c*(p + 1)), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 653

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(e*
(d + e*x)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(p + 2))/(c*(p +
 1)), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}\right.}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}\right.}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4}{}$$

$$= -\frac{bf^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4}{}$$

$$= -\frac{4bf^4\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bf^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx}{3c(}$$

Mathematica [A] time = 5.10115, size = 599, normalized size = 1.85

$$f\left(-12a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right)+\frac{16a(2cx+1)\sqrt{cdx+d}\sqrt{f-cfx}}{(cx+1)^2}-\frac{b\sqrt{cdx+d}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)-\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)\right)\left(2\sin\left(\frac{1}{2}\sin^{-1}\right.\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (f*((16*a*(1 + 2*c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x)^2 - 12*a*S
qrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f
]*(-1 + c^2*x^2))] - (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]
 - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[c*x] + 9*ArcSin[c
*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*
x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 3*(2 +
 Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((-1 + c*x)*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[
c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]
*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(
-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((-1 + c*x)*(C
os[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4)))/(12*c*d^3)
```

Maple [F] time = 0.233, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(-cfx+f\right)^{\frac{3}{2}}(cdx+d)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(acfx - af + \left(bcfx - bf\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cfx + f}}{c^3d^3x^3 + 3\,c^2d^3x^2 + 3\,cd^3x + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-cfx + f\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)}{\left(cdx + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

3.516 $\int (d+cdx)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=315

$$\frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{24\left(1-c^2x^2\right)}+\frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{16\left(1-c^2x^2\right)^2}+\frac{5(cdx+d)^{5/2}(f-cfx)^{5/2}}{32bc\left(1-c^2\right.}$$

```
[Out] (-25*b*c*x^2*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2))
+ (5*b*c^3*x^4*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2)
) + (b*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*Sqrt[1 - c^2*x^2])/(36*c) + (x*(
d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*x*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^2) + (5*x*
(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(24*(1 - c^2*x^2))
 + (5*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(32*b*c*(1
 - c^2*x^2)^(5/2))
```

Rubi [A] time = 0.265264, antiderivative size = 315, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4673, 4649, 4647, 4641, 30, 14, 261}

$$\frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{24\left(1-c^2x^2\right)}+\frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{16\left(1-c^2x^2\right)^2}+\frac{5(cdx+d)^{5/2}(f-cfx)^{5/2}}{32bc\left(1-c^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (-25*b*c*x^2*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2))
+ (5*b*c^3*x^4*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2)
) + (b*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*Sqrt[1 - c^2*x^2])/(36*c) + (x*(
d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*x*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^2) + (5*x*
(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(24*(1 - c^2*x^2))
 + (5*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(32*b*c*(1
 - c^2*x^2)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)dx = \frac{\left((d+cdx)^{5/2}(f-cfx)^{5/2}\right)\int\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)dx}{\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{\left(5(d+cdx)^{5/2}(f-cfx)^{5/}\right.}{6}$$

$$= \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c}+\frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}\left(a+b\right.$$

$$= \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c}+\frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}\left(a+b\right.$$

$$= -\frac{25bcx^2(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}}+\frac{5bc^3x^4(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}}+\frac{b(}{}$$

Mathematica [A] time = 1.51267, size = 303, normalized size = 0.96

$$\frac{d^2f^2\left(\sqrt{cdx+d}\sqrt{f-cfx}\left(384ac^5x^5\sqrt{1-c^2x^2}-1248ac^3x^3\sqrt{1-c^2x^2}+1584acx\sqrt{1-c^2x^2}+270b\cos\left(2\sin^{-1}(cx)\right)+27b\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*f^2*(360*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(1584*a*
c*x*Sqrt[1 - c^2*x^2] - 1248*a*c^3*x^3*Sqrt[1 - c^2*x^2] + 384*a*c^5*x^5*Sq
rt[1 - c^2*x^2] + 270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] + 2*b*
Cos[6*ArcSin[c*x]]) + 12*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(45*
Sin[2*ArcSin[c*x]] + 9*Sin[4*ArcSin[c*x]] + Sin[6*ArcSin[c*x]])))/(2304*c*S
qrt[1 - c^2*x^2])
```

Maple [F] time = 0.226, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{5}{2}} \left(-cfx+f\right)^{\frac{5}{2}} (a+b\arcsin(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^4d^2f^2x^4 - 2\,ac^2d^2f^2x^2 + ad^2f^2 + \left(bc^4d^2f^2x^4 - 2\,bc^2d^2f^2x^2 + bd^2f^2\right)\arcsin(cx)\right)\sqrt{cdx+d}\sqrt{-cfx+f}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^4*d^2*f^2*x^4 - 2*a*c^2*d^2*f^2*x^2 + a*d^2*f^2 + (b*c^4*d^2*
f^2*x^4 - 2*b*c^2*d^2*f^2*x^2 + b*d^2*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{5}{2}} \left(-cfx + f\right)^{\frac{5}{2}} (b \arcsin (cx) + a) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

3.517 $\int (d+cdx)^{3/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=414

$$\frac{3fx(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8\left(1-c^2x^2\right)}+\frac{3f(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\left(1-c^2x^2\right)^{3/2}}+\frac{f\left(1-c^2x^2\right)(cdx+d)^{3}}{}$$

```
[Out] -(b*f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(5*(1 - c^2*x^2)^(3/2)) - (5*b
*c*f*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) + (2
*b*c^2*f*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2))
+ (b*c^3*f*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)
) - (b*c^4*f*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/
2)) + (f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*
f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^
2)) + (f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*
x]))/(5*c) + (3*f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2
)/(16*b*c*(1 - c^2*x^2)^(3/2))
```

Rubi [A] time = 0.38232, antiderivative size = 414, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4673, 4763, 4649, 4647, 4641, 30, 14, 4677, 194}

$$\frac{3fx(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8\left(1-c^2x^2\right)}+\frac{3f(cdx+d)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\left(1-c^2x^2\right)^{3/2}}+\frac{f\left(1-c^2x^2\right)(cdx+d)^{3}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] -(b*f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(5*(1 - c^2*x^2)^(3/2)) - (5*b
*c*f*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) + (2
*b*c^2*f*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2))
+ (b*c^3*f*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)
) - (b*c^4*f*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/
2)) + (f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*
f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^
2)) + (f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*
x]))/(5*c) + (3*f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2
)/(16*b*c*(1 - c^2*x^2)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
```

```
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)dx=\frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int(f-cfx)\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}$$

$$=\frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\left(f\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-cfx\left(\right.\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$=\frac{\left(f(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)dx}{\left(1-c^2x^2\right)^{3/2}}-\frac{(c}{}$$

$$=\frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{f(d+cdx)^{3/2}(f-cf}{}$$

$$=\frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{3fx(d+cdx)^{3/2}(f-}{8(1}$$

$$=-\frac{bfx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}}-\frac{5bcfx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}+\frac{2b}{}$$

Mathematica [A] time = 1.45541, size = 305, normalized size = 0.74

$$\frac{df^2\left(\sqrt{cdx+d}\sqrt{f-cfx}\left(240a\sqrt{1-c^2x^2}\left(8c^4x^4-10c^3x^3-16c^2x^2+25cx+8\right)-128bcx\left(3c^4x^4-10c^2x^2+15\right)+120\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*f^2*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-128*b*
c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 240*a*Sqrt[1 - c^2*x^2]*(8 + 25*c*x - 1
6*c^2*x^2 - 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b*Cos[
4*ArcSin[c*x]]) + 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(32*(1 -
 c^2*x^2)^(5/2) + 40*Sin[2*ArcSin[c*x]] + 5*Sin[4*ArcSin[c*x]])))/(9600*c*S
qrt[1 - c^2*x^2])
```

Maple [F] time = 0.224, size = 0, normalized size = 0.

$$\int(cdx+d)^{\frac{3}{2}}\left(-cfx+f\right)^{\frac{5}{2}}(a+b\arcsin(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^3df^2x^3 - ac^2df^2x^2 - acdf^2x + adf^2 + \left(bc^3df^2x^3 - bc^2df^2x^2 - bcdf^2x + bdf^2\right)\arcsin(cx)\right)\sqrt{cdx + d}\sqrt{-cf\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^3*d*f^2*x^3 - a*c^2*d*f^2*x^2 - a*c*d*f^2*x + a*d*f^2 + (b*c^
3*d*f^2*x^3 - b*c^2*d*f^2*x^2 - b*c*d*f^2*x + b*d*f^2)*arcsin(c*x))*sqrt(c*
d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{3}{2}}(-cfx + f)^{\frac{5}{2}}(b\arcsin(cx) + a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

3.518 $\int \sqrt{d+cdx}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=376

$$\frac{1}{4}c^2f^2x^3\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)+\frac{5f^2\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\sqrt{1-c^2x^2}}+\frac{2f^2\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{}}{3}$$

```
[Out] (-2*b*f^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c
*f^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (2*b*c^2
*f^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*f^
2*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*f^2*x*Sq
rt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*f^2*x^3*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 + (2*f^2*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*f^2*Sqrt[d + c*
d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.539114, antiderivative size = 376, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 4763, 4647, 4641, 30, 4677, 4697, 4707}

$$\frac{1}{4}c^2f^2x^3\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)+\frac{5f^2\sqrt{cdx+d}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)^2}{16bc\sqrt{1-c^2x^2}}+\frac{2f^2\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (-2*b*f^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c
*f^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (2*b*c^2
*f^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*f^
2*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*f^2*x*Sq
rt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*f^2*x^3*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 + (2*f^2*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*f^2*Sqrt[d + c*
d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
```

```
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rubi steps

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)dx = \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (f-cfx)^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \left(f^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - 2cf^2x\sqrt{1-c}\right.}{\sqrt{1-c^2x}}$$

$$= \frac{\left(f^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)dx}{\sqrt{1-c^2x^2}} - \frac{\left(2cf^2\sqrt{d}\right.}{}$$

$$= \frac{1}{2}f^2x\sqrt{d+cdx}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right) + \frac{1}{4}c^2f^2x^3\sqrt{d+cdx}\sqrt{f-c}$$

$$= -\frac{2bf^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{2bc^2f^2x^3\sqrt{}}{9}$$

$$= -\frac{2bf^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{3bcf^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{2bc^2f^2x^3}{9}$$

Mathematica [A] time = 1.2032, size = 293, normalized size = 0.78

$$\frac{f^2\sqrt{cdx+d}\sqrt{f-cfx}\left(48a\sqrt{1-c^2x^2}\left(6c^3x^3-16c^2x^2+9cx+16\right)+256bcx\left(c^2x^2-3\right)+144b\cos\left(2\sin^{-1}(cx)\right)-9b\,c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (360*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt[d]*f^
(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] + f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(256*b*c*
x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(16 + 9*c*x - 16*c^2*x^2 + 6*c^3*
x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) - 12*b*f^2*Sqrt[d
 + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) - 24*Sin[2*A
rcSin[c*x]] + 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.235, size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\left(-cfx+f\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ac^2f^2x^2 - 2\,acf^2x + af^2 + \left(bc^2f^2x^2 - 2\,bcf^2x + bf^2\right)\arcsin\left(cx\right)\right)\sqrt{cdx+d}\sqrt{-cfx+f}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\left(-cfx+f\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

3.519 $\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=345

$$\frac{5f^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{cf^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{3f^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{11f^3\left(1-\right.}{3c\sqrt{}}$$

```
[Out] (-11*b*f^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*
c*f^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (b*c^2*f
^3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (11*f^3*(1
- c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*
f^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
) + (c*f^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]) + (5*f^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x])
```

Rubi [A] time = 0.591949, antiderivative size = 345, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4673, 4763, 4641, 4677, 8, 4707, 30}

$$\frac{5f^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{cf^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{3f^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{11f^3\left(1-\right.}{3c\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-11*b*f^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*
c*f^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (b*c^2*f
^3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (11*f^3*(1
- c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*
f^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
) + (c*f^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]) + (5*f^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{3cf^3x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{3c^2f^3x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{c^3f^3x^3\left(a+b\sin\right.}{\sqrt{1-c^2x^2}}\right.}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\left(f^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(3cf^3\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(3c^2f^3\sqrt{1\right.}{}$$

$$= \frac{3f^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3f^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{cf^3x^2\left(1-c\right.}{3\sqrt{d}}$$

$$= -\frac{3bf^3x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{11f^3\left(1-c^2\right.}{3c\sqrt{d}}$$

$$= -\frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{11f^3\left(1-\right.}{3c\sqrt{}}$$

Mathematica [A] time = 1.73426, size = 274, normalized size = 0.79

$$\frac{f^2\sqrt{cdx+d}\sqrt{f-cfx}\left(12a\sqrt{1-c^2x^2}\left(2c^2x^2-9cx+22\right)-270bcx+2b\sin\left(3\sin^{-1}(cx)\right)-27b\cos\left(2\sin^{-1}(cx)\right)\right)-18}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (90*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 180*a*Sqrt[d]*f^(
5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d
]*Sqrt[f]*(-1 + c^2*x^2))] - 6*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin
[c*x]*(9*(-5 + 2*c*x)*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + f^2*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*(-270*b*c*x + 12*a*Sqrt[1 - c^2*x^2]*(22 - 9*c*x +
 2*c^2*x^2) - 27*b*Cos[2*ArcSin[c*x]] + 2*b*Sin[3*ArcSin[c*x]]))/(72*c*d*Sq
rt[1 - c^2*x^2])
```

Maple [F] time = 0.23, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(-cfx+f\right)^{\frac{5}{2}}\frac{1}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^2f^2x^2-2\,acf^2x+af^2+\left(bc^2f^2x^2-2\,bcf^2x+bf^2\right)\arcsin(cx)\right)\sqrt{-cfx+f}}{\sqrt{cdx+d}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(-c*f*x + f)/sqrt(c*d*x + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

3.520 $\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=465

$$-\frac{5f^4(1-cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{15f^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(c\right.}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] (3*b*f^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (
b*c*f^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5
*b*f^4*(1 - c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)^
(3/2)) + (15*b*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
)/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (15*f^4*(1 - c^2*x^2)^2*(a + b*
ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5*f^4*(1 - c*x)*
(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/
2)) - (15*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
+ c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*f^4*(1 - c^2*x^2)^(3/2)*Log[1 + c*
x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.375003, antiderivative size = 465, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4673, 669, 671, 641, 216, 4761, 627, 43, 4641}

$$-\frac{5f^4(1-cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{15f^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(c\right.}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```


```
[Out] (3*b*f^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (
b*c*f^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5
*b*f^4*(1 - c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)^
(3/2)) + (15*b*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
)/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (15*f^4*(1 - c^2*x^2)^2*(a + b*
ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5*f^4*(1 - c*x)*
(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/
2)) - (15*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
+ c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*f^4*(1 - c^2*x^2)^(3/2)*Log[1 + c*
x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 669

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(m +
p))/(c*(p + 1)), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
```

```
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 671

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[(2*c
*d*(m + p))/(c*(m + 2*p + 1)), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p, x], x]
/; FreeQ[{a, c, d, e, p}, x] && EqQ[c*d^2 + a*e^2, 0] && GtQ[m, 1] && NeQ[m
 + 2*p + 1, 0] && IntegerQ[2*p]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*(
a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(f-cfx)^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= -\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{15f^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{15bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right.}{c(d+cdx)^{3/2}(}$$

$$= \frac{15bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15bf^4\left(1-c^2x^2\right)^{3/2}\sin}{4c(d+cdx)^{3/2}(f-c}$$

$$= \frac{15bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15bf^4\left(1-c^2x^2\right)^{3/2}\sin}{4c(d+cdx)^{3/2}(f-c}$$

$$= \frac{3bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bcf^4x^2\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3}}{4c(d+cdx)^{3/2}(f-cfx)^{3}}$$

Mathematica [A] time = 3.56232, size = 685, normalized size = 1.47

$$f^2\left(8a\sqrt{1-c^2x^2}\left(c^2x^2-7cx-24\right)\sqrt{cdx+d}\sqrt{f-cfx}\left(\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)+\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\right)+120a\sqrt{d}\sqrt{f}(cx+1)\sqrt{1}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (f^2*(8*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*(-24 - 7*c*x +
c^2*x^2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 120*a*Sqrt[d]*Sqrt[f]*
(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(S
qrt[d]*Sqrt[f]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) -
 8*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[
c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2]])*Sin[ArcSin[c*x]/2]) - 32*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x + 4*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + (-2 + Sq
rt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x]*(20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*(1
6*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 2*ArcSin[c*x]*(24*Cos[ArcSin
[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSin[c*x])/2] - 24*Sin[ArcSi
n[c*x]/2] + 7*Sin[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2]))))/(16*c*d^2
*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F] time = 0.247, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(-cfx+f\right)^{\frac{5}{2}}(cdx+d)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^2f^2x^2 - 2\,acf^2x + af^2 + \left(bc^2f^2x^2 - 2\,bcf^2x + bf^2\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cfx + f}}{c^2d^2x^2 + 2\,cd^2x + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^2*d^2*x^2 + 2*c
*d^2*x + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-cfx + f\right)^{\frac{5}{2}}\left(b \arcsin\left(cx\right) + a\right)}{\left(cdx + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

3.521 $\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=420

$$\frac{5f^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{10f^5(1-cx)^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^5(1-cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -((b*f^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))) - (8
*b*f^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5
/2)) - (5*b*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(
f - c*f*x)^(5/2)) - (2*f^5*(1 - c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(
3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (10*f^5*(1 - c*x)^2*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (5*f^5
*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2
)) + (5*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*
d*x)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*f^5*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])
/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.394031, antiderivative size = 420, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 669, 641, 216, 4761, 627, 43, 4641}

$$\frac{5f^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{10f^5(1-cx)^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^5(1-cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```


```
[Out] -((b*f^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))) - (8
*b*f^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5
/2)) - (5*b*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(
f - c*f*x)^(5/2)) - (2*f^5*(1 - c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(
3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (10*f^5*(1 - c*x)^2*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (5*f^5
*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2
)) + (5*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*
d*x)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*f^5*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])
/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 669

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(m +
p))/(c*(p + 1)), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
```

```
tegerQ[2*p]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*(
a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)^5\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^5(1-cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{10f^5(1-cx)^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{10f^5(1-c}{3c}$$

$$= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-cx)^4\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(}$$

$$= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-cx)^4\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(}$$

$$= -\frac{bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bf^5\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5\left(1-c^2x^2\right)^{5/2}}{2c(d+cdx)^{5/2}(f}$$

Mathematica [B] time = 6.72092, size = 847, normalized size = 2.02

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (f^2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(23 + 34*c*x + 3*c^2*x^2))/(1 +
c*x)^2 - 60*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/
(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[
c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
 Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^2])*Arc
Sin[c*x] + 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1 - c^2*x
^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((1
 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) + (2*b*Sqrt[d + c*d*x]
*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c
*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Co
s[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]]) + 2*(-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 -
c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2])
)/((1 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) + (b*Sqrt[d + c*d
*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(2*(4 + 6*c*x
 + 6*c^2*x^2 + 52*(1 + c*x)*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 18*ArcSin[c*x]^2*(Cos[ArcSin[c*x
]/2] + Sin[ArcSin[c*x]/2])^3 + ArcSin[c*x]*(-24*Cos[ArcSin[c*x]/2] - 35*Cos
[(3*ArcSin[c*x])/2] + 3*Cos[(5*ArcSin[c*x])/2] + 24*Sin[ArcSin[c*x]/2] - 35
*Sin[(3*ArcSin[c*x])/2] - 3*Sin[(5*ArcSin[c*x])/2])))/((-1 + c*x)*(Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2])^4)))/(12*c*d^3)
```

Maple [F] time = 0.242, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(-cfx+f\right)^{\frac{5}{2}}(cdx+d)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(ac^2f^2x^2 - 2\,acf^2x + af^2 + \left(bc^2f^2x^2 - 2\,bcf^2x + bf^2\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cfx + f}}{c^3d^3x^3 + 3\,c^2d^3x^2 + 3\,cd^3x + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*d^3*x^3 + 3*c
^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-cfx + f\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right) + a\right)}{\left(cdx + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

3.522 $\int \frac{(d+cdx)^{5/2}(a+b\sin^{-1}(cx))}{\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=345

$$\frac{5d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{cd^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{3d^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{11d^3\left(1-c^2\right.}{3c\sqrt{c}}$$

```
[Out] (11*b*d^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*c
*d^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c^2*d^
3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (11*d^3*(1 -
 c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*d
^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
 - (c*d^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x]) + (5*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x])
```

Rubi [A] time = 0.586557, antiderivative size = 345, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4673, 4763, 4641, 4677, 8, 4707, 30}

$$\frac{5d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{cd^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{3d^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{11d^3\left(1-c^2\right.}{3c\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```


```
[Out] (11*b*d^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*c
*d^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c^2*d^
3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (11*d^3*(1 -
 c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*d
^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
 - (c*d^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x]) + (5*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{f-cfx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{3cd^3x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{3c^2d^3x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{c^3d^3x^3\left(a+b\sin\right.}{\sqrt{1-c^2x^2}}\right.}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\left(d^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(3c^2d^3\sqrt{1\right.}{}$$

$$= -\frac{3d^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3d^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{cd^3x^2\left(1-c\right.}{3\sqrt{d}}$$

$$= \frac{3bd^3x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{11d^3\left(1-c^2x\right.}{3c\sqrt{d+}}$$

$$= \frac{11bd^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{11d^3\left(1-c^2\right.}{3c\sqrt{d}}$$

Mathematica [A] time = 2.07864, size = 270, normalized size = 0.78

$$-\frac{d^2\left(\sqrt{cdx+d}\sqrt{f-cfx}\left(12a\sqrt{1-c^2x^2}\left(2c^2x^2+9cx+22\right)-270bcx+2b\sin\left(3\sin^{-1}(cx)\right)+27b\cos\left(2\sin^{-1}(cx)\right)\right)+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] -(d^2*(-90*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 + 180*a*Sqrt[d]*
Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqr
t[d]*Sqrt[f]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[
c*x]*(9*(5 + 2*c*x)*Sqrt[1 - c^2*x^2] - Cos[3*ArcSin[c*x]]) + Sqrt[d + c*d*
x]*Sqrt[f - c*f*x]*(-270*b*c*x + 12*a*Sqrt[1 - c^2*x^2]*(22 + 9*c*x + 2*c^2
*x^2) + 27*b*Cos[2*ArcSin[c*x]] + 2*b*Sin[3*ArcSin[c*x]])))/(72*c*f*Sqrt[1
- c^2*x^2])
```

Maple [F] time = 0.233, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{\frac{5}{2}}\frac{1}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(ac^2d^2x^2+2\,acd^2x+ad^2+\left(bc^2d^2x^2+2\,bcd^2x+bd^2\right)\arcsin(cx)\right)\sqrt{cdx+d}\sqrt{-cfx+f}}{cfx-f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2
*x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c*f*x - f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

3.523 $\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=242

$$\frac{3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{bcd^2x^2\sqrt{1-}}{4\sqrt{cdx+d}\sqrt{f}}$$

```
[Out] (2*b*d^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*d^2*
x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (2*d^2*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*d
^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f -
 c*f*x])
```

Rubi [A] time = 0.419627, antiderivative size = 242, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4673, 4763, 4641, 4677, 8, 4707, 30}

$$\frac{3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{bcd^2x^2\sqrt{1-}}{4\sqrt{cdx+d}\sqrt{f}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (2*b*d^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*d^2*
x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (2*d^2*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*d
^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f -
 c*f*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{f-cfx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{2cd^2x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{c^2d^2x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= \frac{\left(d^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(2cd^2\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(c^2d^2\sqrt{1-\right.}{\sqrt{}}$$

$$= -\frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{d^2\sqrt{1-c^2x^2}}{2bc\sqrt{d+}}$$

$$= \frac{2bd^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bcd^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{d^2}{}$$

Mathematica [A] time = 1.12405, size = 238, normalized size = 0.98

$$\frac{d\sqrt{cdx+d}\sqrt{f-cfx}\left(-4a(cx+4)\sqrt{1-c^2x^2}+16bcx-b\cos\left(2\sin^{-1}(cx)\right)\right)-12ad^{3/2}\sqrt{f}\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right)}{8cf\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (-4*b*d*(4 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + 6*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 12*a*d^(3/2)*S
qrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt
[d]*Sqrt[f]*(-1 + c^2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*b*c*x
- 4*a*(4 + c*x)*Sqrt[1 - c^2*x^2] - b*Cos[2*ArcSin[c*x]]))/(8*c*f*Sqrt[1 -
c^2*x^2])
```

Maple [F] time = 0.23, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx)) (cdx + d)^{\frac{3}{2}} \frac{1}{\sqrt{-cfx + f}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(acdx + ad + (bcdx + bd) \arcsin (cx))\sqrt{cdx + d}\sqrt{-cfx + f}}{cfx - f}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c*f*x - f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

3.524 $\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=141

$$\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{bdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d*(1 - c^2*x
^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (d*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rubi [A] time = 0.257583, antiderivative size = 141, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4673, 4763, 4641, 4677, 8}

$$\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{bdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d*(1 - c^2*x
^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (d*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
```

```
- 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{f-cfx}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\ &= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{cdx\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\ &= \frac{\left(d\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(cd\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\ &= -\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(bd\sqrt{1-c^2x^2}\right)\int 1}{\sqrt{d+cdx}\sqrt{f-cf}}\\ &= \frac{bdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

Mathematica [A] time = 0.705165, size = 200, normalized size = 1.42

$$\frac{\frac{2\sqrt{cdx+d}\sqrt{f-cfx}\left(bcx-a\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}}-2a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right)+\frac{b\sqrt{cdx+d}\sqrt{f-cfx}\sin^{-1}(cx)^2}{\sqrt{1-c^2x^2}}-2b\sqrt{cdx+d}\sqrt{f-cfx}\sin^{-1}(cx)}{2cf}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] ((2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(b*c*x - a*Sqrt[1 - c^2*x^2]))/Sqrt[1 -
 c^2*x^2] - 2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x] + (b*Sqrt[d + c
*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 2*a*Sqrt[d]*Sqrt[f
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x
^2))])/(2*c*f)
```

Maple [F] time = 0.243, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\sqrt{cdx+d}\frac{1}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin{(cx)}+a)}{cfx-f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*f*x - f),
 x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{d\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}{\sqrt{-f\,(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/sqrt(-f*(c*x - 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{cdx+d}(b\arcsin{(cx)}+a)}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

3.525 $\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=55

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c
*f*x])
```

Rubi [A] time = 0.144088, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {4673, 4641}

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c
*f*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\ &= \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

Mathematica [A] time = 0.497645, size = 110, normalized size = 2.

$$\frac{\frac{b\sqrt{1-c^2x^2}\sin^{-1}(cx)^2}{\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{2a\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right)}{\sqrt{d}\sqrt{f}}}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

```
[Out] ((b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (2
*a*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*
x^2))])/(Sqrt[d]*Sqrt[f]))/(2*c)
```

Maple [F] time = 0.21, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\frac{1}{\sqrt{cdx+d}}\frac{1}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin(cx)+a)}{c^2dfx^2-df},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d*f*x^2
 - d*f), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\operatorname{asin}(cx)}{\sqrt{d(cx+1)}\sqrt{-f(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\sqrt{cdx + d}\sqrt{-cfx + f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*sqrt(-c*f*x + f)), x)
```

3.526 $\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=99

$$\frac{bf\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] -((f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2))) + (b*f*(1 - c^2*x^2)^(3/2)*Log[1 + c*x])/(c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.213356, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4673, 637, 4761, 12, 627, 31}

$$\frac{bf\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] -((f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2))) + (b*f*(1 - c^2*x^2)^(3/2)*Log[1 + c*x])/(c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx &= \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(f-cfx)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(bc\left(1-c^2x^2\right)^{3/2}\right)\int \frac{f(1-cx)}{c\left(1-c^2x^2\right)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(bf\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1-cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(bf\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1}{1+cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bf\left(1-c^2x^2\right)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

Mathematica [A] time = 0.363893, size = 79, normalized size = 0.8

$$\frac{\sqrt{cdx+d}\left(a(cx-1)+b\sqrt{1-c^2x^2}\log(-f(cx+1))+b(cx-1)\sin^{-1}(cx)\right)}{cd^2(cx+1)\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] (Sqrt[d + c*d*x]*(a*(-1 + c*x) + b*(-1 + c*x)*ArcSin[c*x] + b*Sqrt[1 - c^2*
x^2]*Log[-(f*(1 + c*x))]))/(c*d^2*(1 + c*x)*Sqrt[f - c*f*x])
```

Maple [F] time = 0.231, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\,(cdx+d)^{-\frac{3}{2}}\frac{1}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.59884, size = 803, normalized size = 8.11

$$\left[\frac{(bcx+b)\sqrt{df}\log\left(\frac{c^6dfx^6+4c^5dfx^5+5c^4dfx^4-4c^2dfx^2-4cdfx-\left(c^4x^4+4c^3x^3+6c^2x^2+4cx\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{df}-2df}{c^4x^4+2c^3x^3-2cx-1}\right)-2\sqrt{cdx+}}{2\left(c^2d^2fx+cd^2f\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] [1/2*((b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c^5*d*f*x^5 + 5*c^4*d*f*x^
4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*x^3 + 6*c^2*x^2 + 4*c*x)*s
qrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c^4*
x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsi
n(c*x) + a))/(c^2*d^2*f*x + c*d^2*f), ((b*c*x + b)*sqrt(-d*f)*arctan((c^2*x
^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(-d
*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)) - sqrt(c*d*x +
 d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d^2*f*x + c*d^2*f)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\operatorname{asin}(cx)}{(d(cx+1))^{\frac{3}{2}}\sqrt{-f(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/((d*(c*x + 1))**(3/2)*sqrt(-f*(c*x - 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)), x)
```

3.527 $\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=265

$$\frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^2\left(1-c^2x^2\right)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf^2}{6}$$

```
[Out] -(b*f^2*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) - (2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) + (f^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5/2)*ArcTanh[
c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5/2
)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.299961, antiderivative size = 265, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 653, 191, 4761, 627, 44, 207, 260}

$$\frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^2\left(1-c^2x^2\right)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf^2}{6}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] -(b*f^2*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) - (2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) + (f^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5/2)*ArcTanh[
c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5/2
)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 653

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(e*
(d + e*x)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(p + 2))/(c*(p +
 1)), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)^2\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc\left(1-c^2\right.\right.}{}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^2\left(1-\right.\right.}{3(d+}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2\left(1-c^2\right.}{6c(d+c}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2\left(1-c^2\right.}{6c(d+c}$$

$$= -\frac{bf^2\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c\right.}{3(d+}$$

$$= -\frac{bf^2\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c\right.}{3(d+}$$

Mathematica [A] time = 0.454037, size = 118, normalized size = 0.45

$$\frac{\sqrt{cdx+d}\left((cx+2)\left(acx-a-b\sqrt{1-c^2x^2}\right)+b(cx+1)\sqrt{1-c^2x^2}\log(-f(cx+1))+b\left(c^2x^2+cx-2\right)\sin^{-1}(cx)\right)}{3cd^3(cx+1)^2\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] (Sqrt[d + c*d*x]*((2 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b*(-2 + c*
x + c^2*x^2)*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))
]))/(3*c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F] time = 0.235, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\,(cdx+d)^{-\frac{5}{2}}\frac{1}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 3.11401, size = 1157, normalized size = 4.37

$$\left[\frac{\left(bc^3x^3+bc^2x^2-bcx-b\right)\sqrt{df}\log\left(\frac{c^6dfx^6+4c^5dfx^5+5c^4dfx^4-4c^2dfx^2-4cdfx-\left(c^4x^4+4c^3x^3+6c^2x^2+4cx\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{df}-}{c^4x^4+2c^3x^3-2cx-1}\right.}{6\left(c^4d^3fx^3+c^3d^3fx^2-c^2d^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c^
5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*x^
3 + 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
```

```
sqrt(d*f) - 2*d*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*(a*c^2*x^2 + sqrt
(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2*b)*arcsin(c*x) - 2*a)
*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 + c^3*d^3*f*x^2 - c^2*d^3
*f*x - c*d^3*f), 1/3*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(-d*f)*arctan
((c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(-d*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)) - (a*c^
2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2*b)*arcsin
(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 + c^3*d^3*f*x
^2 - c^2*d^3*f*x - c*d^3*f)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{(cdx + d)^{\frac{5}{2}} \sqrt{-cfx + f}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)), x)
```

3.528 $\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=463

$$\frac{5d^4(cx+1)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{15d^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2d^4(cx+1)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(c\right.}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] (-3*b*d^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) +
(b*c*d^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (
5*b*d^4*(1 + c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)
^(3/2)) + (15*b*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
))/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (15*d^4*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (5*d^4*(1 + c*x)
*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3
/2)) - (15*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
 + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*d^4*(1 - c^2*x^2)^(3/2)*Log[1 - c
*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.370384, antiderivative size = 463, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4673, 669, 671, 641, 216, 4761, 627, 43, 4641}

$$\frac{5d^4(cx+1)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{15d^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2d^4(cx+1)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(c\right.}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (-3*b*d^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) +
(b*c*d^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (
5*b*d^4*(1 + c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)
^(3/2)) + (15*b*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
))/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (15*d^4*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (5*d^4*(1 + c*x)
*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3
/2)) - (15*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
 + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*d^4*(1 - c^2*x^2)^(3/2)*Log[1 - c
*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 669

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(m +
p))/(c*(p + 1)), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
```

```
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 671

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[(2*c
*d*(m + p))/(c*(m + 2*p + 1)), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p, x], x]
/; FreeQ[{a, c, d, e, p}, x] && EqQ[c*d^2 + a*e^2, 0] && GtQ[m, 1] && NeQ[m
 + 2*p + 1, 0] && IntegerQ[2*p]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*(
a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15d^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} +$$

$$= -\frac{15bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2d^4(1+cx)^3\left(1-c^2x\right.}{c(d+cdx)^{3/2}}$$

$$= -\frac{15bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15bd^4\left(1-c^2x^2\right)^{3/2}\mathrm{s}}{4c(d+cdx)^{3/2}(f-}$$

$$= -\frac{15bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15bd^4\left(1-c^2x^2\right)^{3/2}\mathrm{s}}{4c(d+cdx)^{3/2}(f-}$$

$$= -\frac{3bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bcd^4x^2\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right.}{4c(d+cdx)^{3/2}(f-cfx}$$

Mathematica [A] time = 3.99489, size = 768, normalized size = 1.66

$$d^2\left(\frac{8a\left(c^2x^2+7cx-24\right)\sqrt{cdx+d}\sqrt{f-cfx}}{cx-1} + 120a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right) - \frac{8b(cx+1)\sqrt{cdx+d}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\left(\left(\sin^{-1}(cx)-4\right)\sin\right.\right.}{\sqrt{1-}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (d^2*((8*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-24 + 7*c*x + c^2*x^2))/(-1 + c
*x) + 120*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(S
qrt[d]*Sqrt[f]*(-1 + c^2*x^2))] - (8*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c
*f*x]*(Cos[ArcSin[c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2
*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])^2) - (32*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(ArcSin
[c*x]^2*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + (c*x - 4*Log[Cos[ArcSin
[c*x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) -
 ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] - (-2 + Sqrt[1 - c
^2*x^2])*Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin
[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b*(1 + c*x
)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2]) + 2*(-16*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + 2
*ArcSin[c*x]*(24*Cos[ArcSin[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*Arc
Sin[c*x])/2] + 24*Sin[ArcSin[c*x]/2] - 7*Sin[(3*ArcSin[c*x])/2] + Sin[(5*Ar
cSin[c*x])/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)))/(16*c*f^2)
```

Maple [F] time = 0.245, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{\frac{5}{2}}\left(-cfx+f\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(ac^2d^2x^2 + 2\,acd^2x + ad^2 + \left(bc^2d^2x^2 + 2\,bcd^2x + bd^2\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cfx + f}}{c^2f^2x^2 - 2\,cf^2x + f^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2*
x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^2*f^2*x^2 - 2*c
*f^2*x + f^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx + d)^{\frac{5}{2}}(b\arcsin\left(cx\right) + a)}{\left(-cfx + f\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

3.529 $\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=252

$$-\frac{3d^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{4d^3(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{ba}{(cdx}$$

```
[Out] -((b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))) + (4
*d^3*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(
3/2)*(f - c*f*x)^(3/2)) - (3*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(2*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*d^3*(1 - c^2*x^2)^(3/2)
*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.421953, antiderivative size = 252, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4673, 4775, 637, 4761, 12, 627, 31, 4641, 4677, 8}

$$-\frac{3d^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{4d^3(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{ba}{(cdx}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] -((b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))) + (4
*d^3*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(
3/2)*(f - c*f*x)^(3/2)) - (3*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(2*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*d^3*(1 - c^2*x^2)^(3/2)
*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{4\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}} - \frac{3d^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{cd^3x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(3d^3\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} -$$

$$= \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3d^3\left(1\right.}{2b}$$

$$= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{d^3\left(1-c^2x^2\right.}{c(d+cdx}$$

$$= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{d^3\left(1-c^2x^2\right.}{c(d+cdx}$$

$$= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{d^3\left(1-c^2x^2\right.}{c(d+cdx}$$

Mathematica [B] time = 2.66777, size = 514, normalized size = 2.04

$$\frac{d\left(6a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right) + \frac{2a(cx-5)\sqrt{cdx+d}\sqrt{f-cfx}}{cx-1} - \frac{b(cx+1)\sqrt{cdx+d}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\left(\left(\sin^{-1}(cx)-4\right)\sin^{-1}(cx)-8\log\left(\cos\left(\frac{1}{2}\right.\right.\right.\right.}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\sin^{-1}\right.\right.}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (d*((2*a*(-5 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x) + 6*a*Sqrt[
d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-
1 + c^2*x^2))] - (b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c
*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] -
 Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) -
 (2*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(ArcSin[c*x]^2*(Cos[ArcSin[
c*x]/2] - Sin[ArcSin[c*x]/2]) + (c*x - 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin[c*x]*((2 + S
qrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] - (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[
c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)))/(2*c*f^2)
```

Maple [F] time = 0.238, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{\frac{3}{2}}\left(-cfx+f\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(acdx + ad + (bcdx + bd)\arcsin(cx))\sqrt{cdx + d}\sqrt{-cfx + f}}{c^2f^2x^2 - 2\,cf^2x + f^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt
(-c*f*x + f)/(c^2*f^2*x^2 - 2*c*f^2*x + f^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx + d)^{\frac{3}{2}}(b\arcsin(cx) + a)}{(-cfx + f)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

3.530 $\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=162

$$-\frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2d^2(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2bd^2\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f
 - c*f*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(
d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*d^2*(1 - c^2*x^2)^(3/2)*Log[1 -
c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.346851, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 4775, 637, 4761, 12, 627, 31, 4641}

$$-\frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2d^2(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2bd^2\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```


```
[Out] (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f
 - c*f*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(
d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*d^2*(1 - c^2*x^2)^(3/2)*Log[1 -
c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
```

```
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int\left(\frac{2\left(d^2+cd^2x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(d^2+cd^2x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(d^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{(2b \cdots}{\cdots}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{(2b \cdots}{\cdots}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{(2b \cdots}{\cdots}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2b \cdots}{c \cdots}$$

Mathematica [A] time = 1.50176, size = 281, normalized size = 1.73

$$-\frac{-2a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right)+\frac{4a\sqrt{cdx+d}\sqrt{f-cfx}}{cx-1}+\frac{b(cx+1)\sqrt{cdx+d}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\left(\left(\sin^{-1}(cx)-4\right)\sin^{-1}(cx)-8\log\left(\cos\left(\frac{1}{2}\sin^{-1}\cdots\right.\right.\right.\right.}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\sin^{-1}(c\cdots\right.\right.}}{2cf^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] -((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x) - 2*a*Sqrt[d]*Sqrt[f]*Ar
cTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))
] + (b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*((-4 +
 ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])
 - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c
*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[
ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2))/(2*c*f^2)
```

Maple [F] time = 0.263, size = 0, normalized size = 0.

$$\int (a + b \arcsin(cx))\sqrt{cdx + d}\left(-cfx + f\right)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{cdx + d}\sqrt{-cfx + f}(b \arcsin(cx) + a)}{c^2 f^2 x^2 - 2 cf^2 x + f^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*f^2*x^2
 - 2*c*f^2*x + f^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{d\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}{\left(-f\left(cx-1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/(-f*(c*x - 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cdx+d}(b\arcsin\left(cx\right)+a)}{\left(-cfx+f\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

3.531 $\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=98

$$\frac{d(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{bd\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c
*f*x)^(3/2)) + (b*d*(1 - c^2*x^2)^(3/2)*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*
(f - c*f*x)^(3/2))
```

Rubi [A] time = 0.210481, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4673, 637, 4761, 12, 627, 31}

$$\frac{d(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{bd\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
```

```
[Out] (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c
*f*x)^(3/2)) + (b*d*(1 - c^2*x^2)^(3/2)*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*
(f - c*f*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx &= \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bc\left(1-c^2x^2\right)^{3/2}\right)\int \frac{d(1+cx)}{c\left(1-c^2x^2\right)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bd\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1+cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bd\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1}{1-cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bd\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

Mathematica [A] time = 0.428999, size = 106, normalized size = 1.08

$$
\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left(a\left(-\sqrt{1-c^2x^2}\right)-b\sqrt{1-c^2x^2}\sin^{-1}(cx)+b(cx-1)\log(f-cfx)\right)}{cdf^2(cx-1)\sqrt{1-c^2x^2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-(a*Sqrt[1 - c^2*x^2]) - b*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + b*(-1 + c*x)*Log[f - c*f*x]))/(c*d*f^2*(-1 + c*x)*Sqrt[1
- c^2*x^2])
```

Maple [F] time = 0.231, size = 0, normalized size = 0.

$$
\int (a+b\arcsin(cx))\frac{1}{\sqrt{cdx+d}}\left(-cfx+f\right)^{-\frac{3}{2}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.5051, size = 803, normalized size = 8.19

$$\left[\frac{(bcx-b)\sqrt{df}\log\left(\frac{c^6dfx^6-4c^5dfx^5+5c^4dfx^4-4c^2dfx^2+4cdfx-\left(c^4x^4-4c^3x^3+6c^2x^2-4cx\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{df}-2df}{c^4x^4-2c^3x^3+2cx-1}\right)-2\sqrt{cdx+d}\sqrt{}}{2\left(c^2df^2x-cdf^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] [1/2*((b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c^5*d*f*x^5 + 5*c^4*d*f*x^
4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*x^3 + 6*c^2*x^2 - 4*c*x)*s
qrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c^4*
x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsi
n(c*x) + a))/(c^2*d*f^2*x - c*d*f^2), ((b*c*x - b)*sqrt(-d*f)*arctan((c^2*x
^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(-d
*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)) - sqrt(c*d*x +
 d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d*f^2*x - c*d*f^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\operatorname{asin}(cx)}{\sqrt{d(cx+1)}\left(-f(cx-1)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}\left(-cfx+f\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)), x)
```

3.532 $\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=96

$$\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{b\left(1-c^2x^2\right)^{3/2}\log\left(1-c^2x^2\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
 + (b*(1 - c^2*x^2)^(3/2)*Log[1 - c^2*x^2])/(2*c*(d + c*d*x)^(3/2)*(f - c*f
*x)^(3/2))
```

Rubi [A] time = 0.174714, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {4673, 4651, 260}

$$\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{b\left(1-c^2x^2\right)^{3/2}\log\left(1-c^2x^2\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
 + (b*(1 - c^2*x^2)^(3/2)*Log[1 - c^2*x^2])/(2*c*(d + c*d*x)^(3/2)*(f - c*f
*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bc\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{b\left(1-c^2x^2\right)^{3/2}\log\left(1-c^2x^2\right)}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

Mathematica [A] time = 0.454177, size = 105, normalized size = 1.09

$$\frac{\sqrt{cdx+d}\left(2acx+b\sqrt{1-c^2x^2}\log(-f(cx+1))+b\sqrt{1-c^2x^2}\log(f-cfx)+2bcx\sin^{-1}(cx)\right)}{2cd^2f(cx+1)\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(2*a*c*x + 2*b*c*x*ArcSin[c*x] + b*Sqrt[1 - c^2*x^2]*Log[-
(f*(1 + c*x))] + b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x]))/(2*c*d^2*f*(1 + c*x)*
Sqrt[f - c*f*x])
```

Maple [F] time = 0.227, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{-\frac{3}{2}}\left(-cfx+f\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x)
```

Maxima [A] time = 1.52171, size = 117, normalized size = 1.22

$$-\frac{bc\sqrt{\frac{1}{c^4df}}\log\left(x^2-\frac{1}{c^2}\right)}{2\,df} + \frac{bx\arcsin(cx)}{\sqrt{-c^2dfx^2+df}df} + \frac{ax}{\sqrt{-c^2dfx^2+df}df}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -1/2*b*c*sqrt(1/(c^4*d*f))*log(x^2 - 1/c^2)/(d*f) + b*x*arcsin(c*x)/(sqrt(-
c^2*d*f*x^2 + d*f)*d*f) + a*x/(sqrt(-c^2*d*f*x^2 + d*f)*d*f)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin(cx)+a)}{c^4d^2f^2x^4-2\,c^2d^2f^2x^2+d^2f^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^4*d^2*f^2*
x^4 - 2*c^2*d^2*f^2*x^2 + d^2*f^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{3}{2}}\left(-cfx+f\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)), x)
```

3.533 $\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=255

$$\frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf\left(1-c^2x^2\right)^{5/2}}{6c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf(1}{3c(}$$

```
[Out] -(b*f*(1 - c^2*x^2)^(5/2))/(6*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/
2)) - (f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(f - c*f*x)^(5/2)) + (2*f*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d +
c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/(6
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*Log[1 -
c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.261779, antiderivative size = 255, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 639, 191, 4761, 627, 44, 207, 260}

$$\frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf\left(1-c^2x^2\right)^{5/2}}{6c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf(1}{3c(}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```


```
[Out] -(b*f*(1 - c^2*x^2)^(5/2))/(6*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/
2)) - (f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(f - c*f*x)^(5/2)) + (2*f*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d +
c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/(6
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*Log[1 -
c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 639

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] + Dist[(d*(2*p + 3))/(2*
a*(p + 1)), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc\left(1-c^2\right.\right.}{}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf\left(1-c^2\right.\right.}{3(d+c}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf\left(1-c^2x\right.}{3c(d+c}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf\left(1-c^2x\right.}{3c(d+c}$$

$$= -\frac{bf\left(1-c^2x^2\right)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c\right.}{3(d+}$$

$$= -\frac{bf\left(1-c^2x^2\right)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c\right.}{3(d+}$$

Mathematica [A] time = 0.598244, size = 180, normalized size = 0.71

$$\frac{\sqrt{cdx+d}\left(8ac^2x^2+8acx-4a+3bcx\sqrt{1-c^2x^2}\log(f-cfx)+5b(cx+1)\sqrt{1-c^2x^2}\log(-f(cx+1))+3b\sqrt{1-c^2x^2}\log\right.}{12cd^3f(cx+1)^2\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-4*a + 8*a*c*x + 8*a*c^2*x^2 - 2*b*Sqrt[1 - c^2*x^2] + 4*
b*(-1 + 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 5*b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Lo
g[-(f*(1 + c*x))] + 3*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 3*b*c*x*Sqrt[1 -
 c^2*x^2]*Log[f - c*f*x]))/(12*c*d^3*f*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F] time = 0.227, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{-\frac{5}{2}}\left(-cfx+f\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin(cx)+a)}{c^5d^3f^2x^5+c^4d^3f^2x^4-2\,c^3d^3f^2x^3-2\,c^2d^3f^2x^2+cd^3f^2x+d^3f^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^3*f^2*
x^5 + c^4*d^3*f^2*x^4 - 2*c^3*d^3*f^2*x^3 - 2*c^2*d^3*f^2*x^2 + c*d^3*f^2*x
 + d^3*f^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{(cdx + d)^{\frac{5}{2}} (-cfx + f)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)), x)
```

3.534 $\int \frac{(d+cdx)^{5/2}(a+b\sin^{-1}(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=419

$$-\frac{5d^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{10d^5(cx+1)^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^5(cx+1)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] (b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (8*b*
d^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)
) - (5*b*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(f -
 c*f*x)^(5/2)) + (2*d^5*(1 + c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (10*d^5*(1 + c*x)^2*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (5*d^5*(1
 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
+ (5*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*d^5*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.379825, antiderivative size = 419, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 669, 641, 216, 4761, 627, 43, 4641}

$$-\frac{5d^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{10d^5(cx+1)^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^5(cx+1)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```


```
[Out] (b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (8*b*
d^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)
) - (5*b*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(f -
 c*f*x)^(5/2)) + (2*d^5*(1 + c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (10*d^5*(1 + c*x)^2*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (5*d^5*(1
 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
+ (5*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*d^5*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 669

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(m +
p))/(c*(p + 1)), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
```

```
tegerQ[2*p]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*(
a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^5\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^5(1+cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{10d^5(1+cx)^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{5bd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{10d^5(1+}{3}$$

$$= \frac{5bd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx)^4\left(1-c^2x^2\right.}{3c(d+cdx)^{5/2}}$$

$$= \frac{5bd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx)^4\left(1-c^2x^2\right.}{3c(d+cdx)^{5/2}}$$

$$= \frac{bd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bd^5\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5\left(1-c^2x^2\right)^{5}}{2c(d+cdx)^{5/2}(}$$

Mathematica [B] time = 5.79286, size = 850, normalized size = 2.03

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (d^2*((-4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(23 - 34*c*x + 3*c^2*x^2))/(-1
+ c*x)^2 - 60*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
)/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*
(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] +
2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin
[ArcSin[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2])) + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[
ArcSin[c*x]/2]*(-8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 +
3*ArcSin[c*x])) + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 +
 2*(2 + 7*Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin
[c*x]^2 + 28*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]])*Sin[ArcSin[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f
*x]*(2*(-7 + 6*c*x + 3*Cos[2*ArcSin[c*x]] + 52*(-1 + c*x)*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + 18
*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + ArcSin[c*x]*(-
24*Cos[ArcSin[c*x]/2] - 35*Cos[(3*ArcSin[c*x])/2] + 3*Cos[(5*ArcSin[c*x])/2
] - 24*Sin[ArcSin[c*x]/2] + 35*Sin[(3*ArcSin[c*x])/2] + 3*Sin[(5*ArcSin[c*x
])/2])))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]))))/(12*c*f^3)
```

Maple [F] time = 0.247, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{\frac{5}{2}}\left(-cfx+f\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(ac^2d^2x^2+2\,acd^2x+ad^2+\left(bc^2d^2x^2+2\,bcd^2x+bd^2\right)\arcsin\left(cx\right)\right)\sqrt{cdx+d}\sqrt{-cfx+f}}{c^3f^3x^3-3\,c^2f^3x^2+3\,cf^3x-f^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2
*x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*f^3*x^3 - 3*
c^2*f^3*x^2 + 3*c*f^3*x - f^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}{\left(-cfx+f\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

3.535 $\int \frac{(d+cdx)^{3/2}(a+b\sin^{-1}(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=324

$$-\frac{2d^4(cx+1)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^4(cx+1)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)\left(a+b\sin\right.}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] (-4*b*d^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*d^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (2*d^4*(1 + c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (d^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*d^4*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.341036, antiderivative size = 324, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4673, 669, 653, 216, 4761, 627, 43, 31, 4641}

$$-\frac{2d^4(cx+1)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^4(cx+1)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)\left(a+b\sin\right.}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```


```
[Out] (-4*b*d^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*d^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (2*d^4*(1 + c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (d^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*d^4*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 669

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(m +
p))/(c*(p + 1)), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 653

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(e*
(d + e*x)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(p + 2))/(c*(p +
 1)), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right.}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right.}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - 2d^4(1+$$

$$= -\frac{bd^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - 2d^4(1+$$

$$= -\frac{4bd^4\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3(}{3c(d+}$$

Mathematica [A] time = 4.43157, size = 601, normalized size = 1.85

$$d\left(-12a\sqrt{d}\sqrt{f}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(c^2x^2-1\right)}\right) + \frac{16a(2cx-1)\sqrt{cdx+d}\sqrt{f-cfx}}{(cx-1)^2} + \frac{2b\sqrt{cdx+d}\sqrt{f-cfx}\left(2\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)\left(\left(\sqrt{1-c^2x^2}+2\right)\sin^{-1}(cx)+2\left(\sqrt{1-c^2x\right.\right.\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (d*((16*a*(-1 + 2*c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x)^2 - 12*a
*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt
[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x
]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])
- Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]]) + 2*(2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 2*(2 + Sqrt[1 -
 c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]
))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(-
8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*ArcSin[c*x])) +
 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 2*(2 + 7*Sqrt[1
- c^2*x^2])*ArcSin[c*x] - 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 28*(2 +
 Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSi
n[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2
] + Sin[ArcSin[c*x]/2]))))/(12*c*f^3)
```

Maple [F] time = 0.232, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\,(cdx+d)^{\frac{3}{2}}\left(-cfx+f\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(acdx + ad + (bcdx + bd)\arcsin(cx))\sqrt{cdx + d}\sqrt{-cfx + f}}{c^3f^3x^3 - 3\,c^2f^3x^2 + 3\,cf^3x - f^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^3*f^3*x^3 - 3*c^2*f^3*x^2 + 3*c*f^3*x - f^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx + d)^{\frac{3}{2}}(b\arcsin(cx) + a)}{(-cfx + f)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

3.536 $\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=164

$$\frac{d^3(cx+1)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^3\left(1-c^2x^2\right)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] (-2*b*d^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (d^3*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^3*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.256099, antiderivative size = 164, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4673, 651, 4761, 12, 627, 43}

$$\frac{d^3(cx+1)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^3\left(1-c^2x^2\right)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (-2*b*d^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (d^3*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^3*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 651

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^m*(a + c*x^2)^(p + 1))/(2*c*d*(p + 1)), x] /; FreeQ[{a, c, d,
e, m, p}, x] && EqQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p] && EqQ[m + 2*p + 2,
0]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc\left(1-c^2x^2\right)^{5/2}\right)\int \frac{d^3(1+cx)^3}{3c\left(1-c^2x^2\right)^2}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{(1+cx)^3}{\left(1-c^2x^2\right)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{1+cx}{(1-cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3\left(1-c^2x^2\right)^{5/2}\right)\int \left(\frac{2}{(-1+cx)^2}+\frac{1}{-1+cx}\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^3(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{b}{3}$$

Mathematica [A] time = 0.486667, size = 126, normalized size = 0.77

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left((cx+1)\left(a\sqrt{1-c^2x^2}+bcx-b\right)+b(cx+1)\sqrt{1-c^2x^2}\sin^{-1}(cx)-b(cx-1)^2\log(f-cfx)\right)}{3cf^3(cx-1)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*((1 + c*x)*(-b + b*c*x + a*Sqrt[1 - c^2*x^
2]) + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - b*(-1 + c*x)^2*Log[f - c*
f*x]))/(3*c*f^3*(-1 + c*x)^2*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.242, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\sqrt{cdx+d}\left(-cfx+f\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 3.24564, size = 1137, normalized size = 6.93

$$\left[\frac{\left(bc^3fx^3 - bc^2fx^2 - bcfx + bf\right)\sqrt{\frac{d}{f}}\log\left(\frac{c^6dx^6-4c^5dx^5+5c^4dx^4-4c^2dx^2+4cdx+\left(c^4x^4-4c^3x^3+6c^2x^2-4cx\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{\frac{d}{f}}-2d}{c^4x^4-2c^3x^3+2cx-1}\right)}{6\left(c^4f^3x^3 - c^3f^3x^2 - c^2f^3x\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*f*x^3 - b*c^2*f*x^2 - b*c*f*x + b*f)*sqrt(d/f)*log((c^6*d*x^6
- 4*c^5*d*x^5 + 5*c^4*d*x^4 - 4*c^2*d*x^2 + 4*c*d*x + (c^4*x^4 - 4*c^3*x^3
+ 6*c^2*x^2 - 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sq
rt(d/f) - 2*d)/(c^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) + 2*(a*c^2*x^2 - 2*sqrt(-
c^2*x^2 + 1)*b*c*x + 2*a*c*x + (b*c^2*x^2 + 2*b*c*x + b)*arcsin(c*x) + a)*s
qrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*f^3*x^3 - c^3*f^3*x^2 - c^2*f^3*x + c
*f^3), -1/3*((b*c^3*f*x^3 - b*c^2*f*x^2 - b*c*f*x + b*f)*sqrt(-d/f)*arctan(
(c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*s
qrt(-d/f)/(c^4*d*x^4 - 2*c^3*d*x^3 - c^2*d*x^2 + 2*c*d*x)) - (a*c^2*x^2 - 2
*sqrt(-c^2*x^2 + 1)*b*c*x + 2*a*c*x + (b*c^2*x^2 + 2*b*c*x + b)*arcsin(c*x)
 + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*f^3*x^3 - c^3*f^3*x^2 - c^2*f^
3*x + c*f^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cdx + d}(b \arcsin (cx) + a)}{\left(-cfx + f\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

3.537 $\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=265

$$\frac{d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^2(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bd^2\left(1\right.}{6c(c}$$

```
[Out] -(b*d^2*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) + (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^2*(1 - c^2*x^2)^(5/2)*ArcTanh[
c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d^2*(1 - c^2*x^2)^(5/2
)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.286408, antiderivative size = 265, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 653, 191, 4761, 627, 44, 207, 260}

$$\frac{d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^2(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bd^2\left(1\right.}{6c(c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```


```
[Out] -(b*d^2*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) + (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^2*(1 - c^2*x^2)^(5/2)*ArcTanh[
c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d^2*(1 - c^2*x^2)^(5/2
)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 653

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(e*
(d + e*x)*(a + c*x^2)^(p + 1))/(c*(p + 1)), x] - Dist[(e^2*(p + 2))/(c*(p +
 1)), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc\left(1-c \ldots\right.\right.}{\ldots}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^2\left(1 \ldots\right.\right.}{3(d+\ldots}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd^2\left(1-c \ldots\right.}{6c(d+\ldots}$$

$$= \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd^2\left(1-c \ldots\right.}{6c(d+\ldots}$$

$$= -\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x\left(1 \ldots\right.}{3(\ldots}$$

$$= -\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^2(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x\left(1 \ldots\right.}{3(\ldots}$$

Mathematica [A] time = 0.462334, size = 130, normalized size = 0.49

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left(-(cx-2)\left(a\sqrt{1-c^2x^2}+bcx-b\right)-b(cx-2)\sqrt{1-c^2x^2}\sin^{-1}(cx)+b(cx-1)^2\log(f-cfx)\right)}{3cdf^3(cx-1)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-((-2 + c*x)*(-b + b*c*x + a*Sqrt[1 - c^2
*x^2])) - b*(-2 + c*x)*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + b*(-1 + c*x)^2*Log[f
 - c*f*x]))/(3*c*d*f^3*(-1 + c*x)^2*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.229, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\frac{1}{\sqrt{cdx+d}}\left(-cfx+f\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 3.43468, size = 1157, normalized size = 4.37

$$\left[\frac{\left(bc^3x^3-bc^2x^2-bcx+b\right)\sqrt{df}\log\left(\frac{c^6dfx^6-4c^5dfx^5+5c^4dfx^4-4c^2dfx^2+4cdfx-\left(c^4x^4-4c^3x^3+6c^2x^2-4cx\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{df}-2df}{c^4x^4-2c^3x^3+2cx-1}\right.}{6\left(c^4df^3x^3-c^3df^3x^2-c^2df^3x\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c^
5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*x^
3 + 6*c^2*x^2 - 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
```

```
sqrt(d*f) - 2*d*f)/(c^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*(a*c^2*x^2 + sqrt
(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2*b)*arcsin(c*x) - 2*a)
*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 - c^3*d*f^3*x^2 - c^2*d*f
^3*x + c*d*f^3), 1/3*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(-d*f)*arctan
((c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(-d*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)) - (a*c^
2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2*b)*arcsin
(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 - c^3*d*f^3*x
^2 - c^2*d*f^3*x + c*d*f^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\sqrt{cdx + d}\left(-cfx + f\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)), x)
```

3.538 $\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=255

$$\frac{2dx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{d(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd\left(1-c^2x^2\right)^{5/2}}{6c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bd\left(1-c\right.}{3c(cdx}$$

```
[Out] -(b*d*(1 - c^2*x^2)^(5/2))/(6*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/
2)) + (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(f - c*f*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d +
c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/(6
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d*(1 - c^2*x^2)^(5/2)*Log[1 -
c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rubi [A] time = 0.252146, antiderivative size = 255, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4673, 639, 191, 4761, 627, 44, 207, 260}

$$\frac{2dx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{d(cx+1)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd\left(1-c^2x^2\right)^{5/2}}{6c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bd\left(1-c\right.}{3c(cdx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] -(b*d*(1 - c^2*x^2)^(5/2))/(6*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/
2)) + (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(f - c*f*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d +
c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/(6
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d*(1 - c^2*x^2)^(5/2)*Log[1 -
c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 639

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] + Dist[(d*(2*p + 3))/(2*
a*(p + 1)), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4761

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \cdots$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \cdots$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \cdots$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \cdots$$

$$= -\frac{bd\left(1-c^2x^2\right)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \cdots$$

$$= -\frac{bd\left(1-c^2x^2\right)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \cdots$$

Mathematica [A] time = 0.624456, size = 184, normalized size = 0.72

$$\frac{\sqrt{cdx+d}\left(8ac^2x^2-8acx-4a+5bcx\sqrt{1-c^2x^2}\log(f-cfx)+3b(cx-1)\sqrt{1-c^2x^2}\log(-f(cx+1))-5b\sqrt{1-c^2x^2}\log(f\right.}{12cd^2f^2\left(c^2x^2-1\right)\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-4*a - 8*a*c*x + 8*a*c^2*x^2 + 2*b*Sqrt[1 - c^2*x^2] + 4*
b*(-1 - 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 3*b*(-1 + c*x)*Sqrt[1 - c^2*x^2]*L
og[-(f*(1 + c*x))] - 5*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 5*b*c*x*Sqrt[1
- c^2*x^2]*Log[f - c*f*x]))/(12*c*d^2*f^2*Sqrt[f - c*f*x]*(-1 + c^2*x^2))
```

Maple [F] time = 0.23, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{-\frac{3}{2}}\left(-cfx+f\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin(cx)+a)}{c^5d^2f^3x^5-c^4d^2f^3x^4-2\,c^3d^2f^3x^3+2\,c^2d^2f^3x^2+cd^2f^3x-d^2f^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^2*f^3
*x^5 - c^4*d^2*f^3*x^4 - 2*c^3*d^2*f^3*x^3 + 2*c^2*d^2*f^3*x^2 + c*d^2*f^3*
x - d^2*f^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{(cdx + d)^{\frac{3}{2}} \left(-cfx + f\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)), x)
```

3.539 $\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=188

$$\frac{2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{b\left(1-c^2x^2\right)^{3/2}}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{b\left(1-c^2x^2\right)^{5/2}\log\left(1-c^2x^2\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -(b*(1 - c^2*x^2)^(3/2))/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (x*(1
- c^2*x^2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (
2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) + (b*(1 - c^2*x^2)^(5/2)*Log[1 - c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f
- c*f*x)^(5/2))
```

Rubi [A] time = 0.202007, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4673, 4655, 4651, 260, 261}

$$\frac{2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{b\left(1-c^2x^2\right)^{3/2}}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{b\left(1-c^2x^2\right)^{5/2}\log\left(1-c^2x^2\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] -(b*(1 - c^2*x^2)^(3/2))/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (x*(1
- c^2*x^2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (
2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) + (b*(1 - c^2*x^2)^(5/2)*Log[1 - c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f
- c*f*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc\left(1-c^2x^2\right)^{5/2}\right.}{3(d+cdx)^{5/2}(}$$

$$= -\frac{b\left(1-c^2x^2\right)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2x\left(1-c^2x^2\right)^2\left(a+b\,\mathrm{s}\right.}{3(d+cdx)^{5/2}(f-c}$$

$$= -\frac{b\left(1-c^2x^2\right)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2x\left(1-c^2x^2\right)^2\left(a+b\,\mathrm{s}\right.}{3(d+cdx)^{5/2}(f-c}$$

Mathematica [A] time = 0.582059, size = 178, normalized size = 0.95

$$\frac{\sqrt{cdx+d}\left(4ac^3x^3-6acx+2bc^2x^2\sqrt{1-c^2x^2}\log(f-cfx)-2b\left(1-c^2x^2\right)^{3/2}\log(-f(cx+1))-2b\sqrt{1-c^2x^2}\log(f-cf\right.}{6cd^3(cx-1)\sqrt{f-cfx}(cfx+f)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*c*x*(-
3 + 2*c^2*x^2)*ArcSin[c*x] - 2*b*(1 - c^2*x^2)^(3/2)*Log[-(f*(1 + c*x))] -
2*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 2*b*c^2*x^2*Sqrt[1 - c^2*x^2]*Log[f
- c*f*x]))/(6*c*d^3*(-1 + c*x)*Sqrt[f - c*f*x]*(f + c*f*x)^2)
```

Maple [F] time = 0.228, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))(cdx+d)^{-\frac{5}{2}}\left(-cfx+f\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x)
```

Maxima [A] time = 1.5401, size = 239, normalized size = 1.27

$$\frac{1}{6}bc\left(\frac{1}{c^4d^{\frac{5}{2}}f^{\frac{5}{2}}x^2-c^2d^{\frac{5}{2}}f^{\frac{5}{2}}}+\frac{2\log(cx+1)}{c^2d^{\frac{5}{2}}f^{\frac{5}{2}}}+\frac{2\log(cx-1)}{c^2d^{\frac{5}{2}}f^{\frac{5}{2}}}\right)+\frac{1}{3}b\left(\frac{x}{\left(-c^2dfx^2+df\right)^{\frac{3}{2}}df}+\frac{2x}{\sqrt{-c^2dfx^2+df}d^2f^2}\right)\arcsin($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/6*b*c*(1/(c^4*d^(5/2)*f^(5/2)*x^2 - c^2*d^(5/2)*f^(5/2)) + 2*log(c*x + 1)
/(c^2*d^(5/2)*f^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2)*f^(5/2))) + 1/3*b*(x/(
(-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d^2*f^2))*a
rcsin(c*x) + 1/3*a*(x/((-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2*d*f
*x^2 + d*f)*d^2*f^2))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin(cx)+a)}{c^6d^3f^3x^6-3\,c^4d^3f^3x^4+3\,c^2d^3f^3x^2-d^3f^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^6*d^3*f^3
*x^6 - 3*c^4*d^3*f^3*x^4 + 3*c^2*d^3*f^3*x^2 - d^3*f^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{5}{2}}\left(-cfx+f\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)), x)
```

3.540 $\int (d+cdx)^{5/2}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=613

$$-\frac{bc^3d^2x^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2-\frac{4bc^2d^2x^3\sqrt{cdx+d}\sqrt{e-}}{9\sqrt{1-}}$$

```
[Out] (8*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*d^2*x*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x])/32 + (4*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c) +
 (15*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c^
2*x^2]) + (4*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(
3*Sqrt[1 - c^2*x^2]) - (3*b*c*d^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (4*b*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2*x^4*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) +
 (3*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*d
^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 - (2*d^2*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
(5*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt[
1 - c^2*x^2])
```

Rubi [A] time = 1.00997, antiderivative size = 613, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4673, 4763, 4647, 4641, 4627, 321, 216, 4677, 4645, 444, 43, 4697, 4707}

$$-\frac{bc^3d^2x^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2-\frac{4bc^2d^2x^3\sqrt{cdx+d}\sqrt{e-}}{9\sqrt{1-}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (8*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*d^2*x*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x])/32 + (4*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c) +
 (15*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c^
2*x^2]) + (4*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(
3*Sqrt[1 - c^2*x^2]) - (3*b*c*d^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (4*b*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2*x^4*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) +
 (3*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*d
^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 - (2*d^2*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
(5*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt[
1 - c^2*x^2])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
```

```
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rubi steps

$$\int (d+cdx)^{5/2}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int (d+cdx)^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2 + 2cd^2x\sqrt{1-c^2x^2}\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2cd^2\sqrt{d+cd\right.}{}$$

$$= \frac{1}{2}d^2x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}\left(a\right.$$

$$= \frac{4bd^2x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{bcd^2x^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+\right.}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex} + \frac{4bd^2x\sqrt{d+}}{}$$

$$= -\frac{15}{64}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2d^2\sqrt{d+}}{}$$

$$= \frac{8b^2d^2\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{15}{64}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2d^2x^3\sqrt{d+}$$

Mathematica [A] time = 2.29064, size = 555, normalized size = 0.91

$$\frac{d^2\sqrt{cdx+d}\sqrt{e-cex}\left(3\left(576a^2c^3x^3\sqrt{1-c^2x^2}+1536a^2c^2x^2\sqrt{1-c^2x^2}+864a^2cx\sqrt{1-c^2x^2}-1536a^2\sqrt{1-c^2x^2}-1024abc^3\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (1440*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*d^(5
/2)*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/
(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt[1 -
 c^2*x^2] + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]] + 288*a*Sin[2
*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] - 36*a*Sin[4*ArcSin[c*x]]) - 72*b*d
^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(-60*a + 48*b*Sqrt[1 - c^2
*x^2] + 16*b*Cos[3*ArcSin[c*x]] - 24*b*Sin[2*ArcSin[c*x]] + 3*b*Sin[4*ArcSi
n[c*x]]) + d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*ArcSin[c*x]]
 + 256*b^2*Cos[3*ArcSin[c*x]] + 3*(3072*a*b*c*x - 1024*a*b*c^3*x^3 - 1536*a
^2*Sqrt[1 - c^2*x^2] + 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*Sqrt[1 - c^
2*x^2] + 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*Sqrt[1 - c^2*
x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]] + 9*b^2*Sin[4
*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.311, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{5}{2}}\left(a+b\arcsin(cx)\right)^2\sqrt{-cex+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(a^2c^2d^2x^2 + 2\,a^2cd^2x + a^2d^2 + \left(b^2c^2d^2x^2 + 2\,b^2cd^2x + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^2d^2x^2 + 2\,abcd^2x + abd^2\right)\text{a}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2*
b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x +
 a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2*(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{5}{2}} \sqrt{-cex + e}(b \arcsin(cx) + a)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

3.541 $\int (d+cdx)^{3/2}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=455

$$-\frac{2bc^2dx^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}-\frac{bcdx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{cdx+d}\sqrt{e-cex}\left(a+\right.}{3\sqrt{1-c^2x^2}}$$

```
[Out] (4*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*d*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x])/4 + (2*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)
)/(27*c) + (b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
- c^2*x^2]) + (2*b*d*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*
ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (2*b*c^2*d*x^3*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 - (d*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.571039, antiderivative size = 455, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {4673, 4763, 4647, 4641, 4627, 321, 216, 4677, 4645, 444, 43}

$$-\frac{2bc^2dx^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}-\frac{bcdx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{cdx+d}\sqrt{e-cex}\left(a+\right.}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (4*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*d*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x])/4 + (2*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)
)/(27*c) + (b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
- c^2*x^2]) + (2*b*d*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*
ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (2*b*c^2*d*x^3*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 - (d*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (d+cdx)^{3/2}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int (d+cdx)\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2+cdx\sqrt{1-c^2x^2}\left(a\right.\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(cd\sqrt{d+cdx}\sqrt{\right.}{}$$

$$= \frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)}{3c}$$

$$= \frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{bcdx^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\right.}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex} + \frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{b}{}$$

$$= -\frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2d\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{4c\sqrt{1-c^2x^2}} + \frac{2bdx\sqrt{d+}}{}$$

$$= \frac{4b^2d\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex} + \frac{2b^2d\sqrt{d+cdx}\sqrt{e-}}{27c}$$

Mathematica [A] time = 1.78636, size = 437, normalized size = 0.96

$$d\sqrt{cdx+d}\sqrt{e-cex}\left(12\left(3a^2\sqrt{1-c^2x^2}\left(2c^2x^2+3cx-2\right)-4abcx\left(c^2x^2-3\right)+9b^2\sqrt{1-c^2x^2}\right)+54ab\cos\left(2\sin^{-1}(cx)\right)-2\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (36*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*d^(3/2)*S
qrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt
[d]*Sqrt[e]*(-1 + c^2*x^2))] - 18*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSi
n[c*x]^2*(-6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] - 3*b*Sin[2*A
rcSin[c*x]]) + d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(12*(9*b^2*Sqrt[1 - c^2*x^
2] - 4*a*b*c*x*(-3 + c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x + 2*c^2
*x^2)) + 54*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] - 27*b^2*Sin[
2*ArcSin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(9*b*Co
s[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^2*x^2*Sqrt[
1 - c^2*x^2] + 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))/(216*c*Sqrt
[1 - c^2*x^2])
```

Maple [F] time = 0.262, size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{3}{2}} (a + b \arcsin (cx))^2 \sqrt{-cex + e}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)

[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="maxima")

[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(a^2cdx + a^2d + \left(b^2cdx + b^2d\right) \arcsin (cx)^2 + 2 \left(abcdx + abd\right) \arcsin (cx)\right) \sqrt{cdx + d}\sqrt{-cex + e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="fricas")

[Out] integral((a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c*
d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2*(-c*e*x+e)**(1/2),x)

[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{3}{2}} \sqrt{-cex + e}(b \arcsin (cx) + a)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

3.542 $\int \sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=222

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(c\right.$$

```
[Out] -(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 + (b^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.298865, antiderivative size = 222, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4673, 4647, 4641, 4627, 321, 216}

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(c\right.$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] -(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 + (b^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\left(a+b\sin^{-1}(c\right.}{\sqrt{1-c^2x^2}}}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin\right.$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{4c\sqrt{1-c^2x^2}} - \frac{bcx^2\sqrt{d+cdx}}{}$$

Mathematica [A] time = 1.01271, size = 288, normalized size = 1.3

$$\frac{3\sqrt{cdx+d}\sqrt{e-cex}\left(4a^2cx\sqrt{1-c^2x^2}+2ab\cos\left(2\sin^{-1}(cx)\right)-b^2\sin\left(2\sin^{-1}(cx)\right)\right)-12a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{cdx+}}{\sqrt{d}\sqrt{e}(}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*Sqrt[
e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*
Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*
(b*Cos[2*ArcSin[c*x]] + 2*a*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*ArcSin[c*x]^2*(2*a + b*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(4*a^2*c*x*Sqrt[1 - c^2*x^2] + 2*a*b*Cos[2*ArcSin[c*x]] - b^
2*Sin[2*ArcSin[c*x]]))/(24*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.266, size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\,\sqrt{-cex+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,(a+b\,\mathrm{asin}(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

3.543 $\int \frac{\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=230

$$-\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{e\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}+\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2b^2e\left(1-c^2x^2\right)}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2b^2ex\sqrt{}}{\sqrt{c}}$$

```
[Out] (-2*a*b*e*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e
*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e*x*Sqrt[1 - c
^2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*(1 - c^2*x^2)*(
a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.44103, antiderivative size = 230, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4673, 4763, 4641, 4677, 4619, 261}

$$-\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{e\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}+\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2b^2e\left(1-c^2x^2\right)}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2b^2ex\sqrt{}}{\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (-2*a*b*e*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e
*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e*x*Sqrt[1 - c
^2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*(1 - c^2*x^2)*(
a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{e\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}-\frac{cex\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{\left(e\sqrt{1-c^2x^2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(ce\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(2be\sqrt{1-c^2x^2}\right)\int (\ldots}{\sqrt{d+cdx}\ldots} \\
&= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} \\
&= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2ex\sqrt{1-c^2x^2}\sin^{-1}(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\ldots \\
&= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2e\left(1-c^2x^2\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2ex\sqrt{1-c^2x^2}\sin^{-1}(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e\left(1-c^2x^2\right)\ldots}{c\sqrt{d}\ldots}
\end{aligned}$$

Mathematica [A] time = 1.14844, size = 296, normalized size = 1.29

$$\frac{3\sqrt{cdx+d}\sqrt{e-cex}\left(a^2\sqrt{1-c^2x^2}-2abcx-2b^2\sqrt{1-c^2x^2}\right)-3a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\left(c^2x^2-1\right)}\right)+3b\sqrt{cdx+d}\sqrt{e}\ldots}{3cd\sqrt{1}\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-2*a*b*c*x + a^2*Sqrt[1 - c^2*x^2] - 2*
b^2*Sqrt[1 - c^2*x^2]) - 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(b*c*x - a*Sqr
```

```
t[1 - c^2*x^2])*ArcSin[c*x] + 3*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*Sq
rt[1 - c^2*x^2])*ArcSin[c*x]^2 + b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin
[c*x]^3 - 3*a^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))])/(3*c*d*Sqrt[1 - c^2*
x^2])
```

Maple [F] time = 0.271, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 \sqrt{-cex + e}\frac{1}{\sqrt{cdx + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x)

[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="maxima")

[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2 \arcsin (cx)^2 + 2\,ab \arcsin (cx) + a^2\right)\sqrt{-cex + e}}{\sqrt{cdx + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="fricas")

[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(-c*e*x + e)/sqr
t(c*d*x + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-e\,(cx - 1)}\,(a + b \operatorname{asin}(cx))^2}{\sqrt{d\,(cx + 1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(1/2),x)
```

```
[Out] Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/sqrt(d*(c*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-cex+e}(b\arcsin{(cx)}+a)^2}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

3.544 $\int \frac{\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=530

$$\frac{4ib^2e^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2e^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2e^2\left(1-c^2x^2\right)^{3/2}\text{Pol}}{c(cdx+d)^{3/2}}$$

```
[Out] (-2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2)) + (2*e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((2*I)*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^2*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b*e^2
*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
 c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(
3/2)) + ((4*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b^2*e^2*(1 - c^2*x^2)^
(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) - ((2*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])]
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 0.947575, antiderivative size = 530, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4673, 4775, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181, 4641}

$$\frac{4ib^2e^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2e^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2e^2\left(1-c^2x^2\right)^{3/2}\text{Pol}}{c(cdx+d)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```


```
[Out] (-2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2)) + (2*e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((2*I)*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^2*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b*e^2
*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
 c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(
3/2)) + ((4*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b^2*e^2*(1 - c^2*x^2)^
(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) - ((2*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])]
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
```

```
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int\left(\frac{2\left(e^2-ce^2x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{e^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int\frac{\left(e^2-ce^2x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(e^2\left(1-c^2x^2\right)^{3/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int\left(\frac{e^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{ce^2x\left(a+b\sin\cdots\right.}{\left(1-c^2x\cdots\right.}\cdots\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2e^2\left(1-c^2x^2\right)^{3/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2ce^2\left(\cdots\right.\right.}{\cdots}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2\left(1-c^2x^2\cdots\right.}{3bc(d+\cdots}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2\left(1-c^2x^2\cdots\right.}{3bc(d+\cdots}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ie^2\left(1-c^2\cdots\right.}{c(d+\cdots}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ie^2\left(1-c^2\cdots\right.}{c(d+\cdots}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ie^2\left(1-c^2\cdots\right.}{c(d+\cdots}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ie^2\left(1-c^2\cdots\right.}{c(d+\cdots}$$

Mathematica [A] time = 3.71217, size = 547, normalized size = 1.03

$$\frac{b^2\sqrt{cdx+d}\sqrt{e-cex}\left(-24i\left(\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)+\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\right)\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)^3\left(-\left(\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)+\cos\left(\frac{1}{2}\sin^{-1}(cx)\right)\right)\right)-(6+6i)\sin^{-1}(cx)^2\left(\text{co}\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] ((-6*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1 + c*x) + 3*a^2*Sqrt[d]*Sqrt[e]
*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^
2))] - (3*a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c
*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + (
(-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2])) + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-6 - 6*I)*ArcSin[c*x
]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) - ArcSin[c*x]^3*(Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]) + 6*ArcSin[c*x]*(I*Pi + 4*Log[1 - I*E^(I*Arc
```

```
Sin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 12*Pi*(2*Log[1 + E^
((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/
2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]) - (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
])))/(3*c*d^2)
```

Maple [F] time = 0.214, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2\sqrt{-cex+e}\,(cdx+d)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^2d^2x^2+2\,cd^2x+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(3/2),x)
```

```
[Out] Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/(d*(c*x + 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

3.545 $\int \frac{\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=486

$$\frac{4ib^2e^3\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ie^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4be^3\left(1-c^2x^2\right)^{5/2}\log\left(1-ie^{i\sin^{-1}(c\cdots}\right.}{3c(cdx+d)^{5/2}(e-c\cdots}$$

```
[Out] ((I/3)*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - (4*b^2*e^3*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^3*(1 - c^2*x^2)^(5/2)*(a
 + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) - (2*b*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 +
 ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + Arc
Sin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*b^2*e^3*(1 - c^2*x^2)^(5/2)*Poly
Log[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.11892, antiderivative size = 486, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4673, 4775, 4773, 3318, 4186, 3767, 8, 4184, 3717, 2190, 2279, 2391}

$$\frac{4ib^2e^3\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ie^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4be^3\left(1-c^2x^2\right)^{5/2}\log\left(1-ie^{i\sin^{-1}(c\cdots}\right.}{3c(cdx+d)^{5/2}(e-c\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] ((I/3)*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - (4*b^2*e^3*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^3*(1 - c^2*x^2)^(5/2)*(a
 + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) - (2*b*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 +
 ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + Arc
Sin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*b^2*e^3*(1 - c^2*x^2)^(5/2)*Poly
Log[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
```

```
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3318

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1*(e + (Pi*a)/(2*b)))/2 +
 (f*x)/2]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 4186

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> -Simp[(b^2*(c + d*x)^m*Cot[e + f*x]*(b*Csc[e + f*x])^(n - 2))/(f*(n -
 1)), x] + (Dist[(b^2*d^2*m*(m - 1))/(f^2*(n - 1)*(n - 2)), Int[(c + d*x)^(
m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[(b^2*(n - 2))/(n - 1), Int[(
c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[(b^2*d*m*(c + d*x)^(m -
1)*(b*Csc[e + f*x])^(n - 2))/(f^2*(n - 1)*(n - 2)), x]) /; FreeQ[{b, c, d,
e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4184

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> -Sim
p[((c + d*x)^m*Cot[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Co
t[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
```

```
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(e-cex)^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{2e^3\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)^2\sqrt{1-c^2x^2}}-\frac{e^3\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{\left(e^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(2e^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{\left(e^3\left(1-c^2x^2\right)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{c+c\sin(x)}\,dx,x,\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(2ce^3\left(1-c^2x^2\right)^{5/2}\right)\text{Sub}}{(d+cd}$$

$$= -\frac{\left(e^3\left(1-c^2x^2\right)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)dx,x,\sin^{-1}(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(e^3\left(1-c^2\right.\right.}{}$$

$$= \frac{e^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2be^3\left(1-c^2x^2\right)^{5/2}\left(a+\right.}{3c(d+}$$

$$= \frac{ie^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{ie^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4b^2e^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

$$= \frac{ie^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4b^2e^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

$$= \frac{ie^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4b^2e^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

$$= \frac{ie^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4b^2e^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

Mathematica [A] time = 7.9466, size = 694, normalized size = 1.43

$$-\frac{b^2(cx-1)\sqrt{cdx+d}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(4i\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+(1+i)\sin^{-1}(cx)^2-i\pi\sin^{-1}(cx)-4\pi\log\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((-2*a^2)/(3*d^3*(1 + c*x)^2) + a^
2/(3*d^3*(1 + c*x))))/c - (a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(
1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x
])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[
ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2]]) + 2*(-2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 4*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sq
rt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4)
 - (b^2*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2)
)]*((-I)*Pi*ArcSin[c*x] + (1 + I)*ArcSin[c*x]^2 - 4*Pi*Log[1 + E^((-I)*ArcS
in[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[
Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog
[2, I*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2])^3 - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[A
rcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (2*(-4 + ArcSin[c*x]^2)*Sin[ArcSin[
c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[-((d + c
*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]
/2])^2)
```

Maple [F] time = 0.267, size = 0, normalized size = 0.

$$\int (a + b\arcsin(cx))^2 \sqrt{-cex + e}\,(cdx + d)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2\arcsin(cx)^2 + 2\,ab\arcsin(cx) + a^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^3d^3x^3 + 3\,c^2d^3x^2 + 3\,cd^3x + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

3.546 $\int (d+cdx)^{5/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=697

$$\frac{2bc^4dx^5(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{25\left(1-c^2x^2\right)^{3/2}}-\frac{4bc^2dx^3(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15\left(1-c^2x^2\right)^{3/2}}-\frac{3bcdx^2(cdx+d)^{3/2}(}{8(}$$

```
[Out] (8*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*d*x*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2))/32 + (16*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2))/(75*c*(1 - c^2*x^2)) - (15*b^2*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
/(64*(1 - c^2*x^2)) + (2*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^2
*x^2))/(125*c) + (9*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])/
(64*c*(1 - c^2*x^2)^(3/2)) + (2*b*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(
a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*d*x^2*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) - (4*b*c^2
*d*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c^
2*x^2)^(3/2)) + (2*b*c^4*d*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*A
rcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*d*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (d*x*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*d*x*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) - (d*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (d*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^(
3/2))
```

Rubi [A] time = 0.800434, antiderivative size = 697, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.469, Rules used = {4673, 4763, 4649, 4647, 4641, 4627, 321, 216, 4677, 195, 194, 4645, 12, 1247, 698}

$$\frac{2bc^4dx^5(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{25\left(1-c^2x^2\right)^{3/2}}-\frac{4bc^2dx^3(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15\left(1-c^2x^2\right)^{3/2}}-\frac{3bcdx^2(cdx+d)^{3/2}(}{8(}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (8*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*d*x*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2))/32 + (16*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2))/(75*c*(1 - c^2*x^2)) - (15*b^2*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
/(64*(1 - c^2*x^2)) + (2*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^2
*x^2))/(125*c) + (9*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])/
(64*c*(1 - c^2*x^2)^(3/2)) + (2*b*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(
a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*d*x^2*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) - (4*b*c^2
*d*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c^
2*x^2)^(3/2)) + (2*b*c^4*d*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*A
rcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*d*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (d*x*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*d*x*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) - (d*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (d*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^(
3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int (d+cdx)\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(d\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+cdx\,(\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left(d(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\left(1-c^2x^2\right)^{3/2}}+\frac{(c}{}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2-\frac{d(d+cdx)^{3/2}(e-cex}{}$$

$$= \frac{2bdx(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5\left(1-c^2x^2\right)^{3/2}}-\frac{4bc^2dx^3(d+cdx)^{3/2}(}{15\,(}$$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}+\frac{2bdx(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\right.}{5\left(1-c^2x^2\right)^{3/2}}$$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{15b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)}+\frac{2}{}$$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{15b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)}+\frac{9}{}$$

$$= \frac{8b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{225c}-\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}+\frac{16b^2}{}$$

Mathematica [A] time = 3.52462, size = 574, normalized size = 0.82

$$\frac{d^2e\left(\sqrt{cdx+d}\sqrt{e-cex}\left(-15\left(480a^2\sqrt{1-c^2x^2}\left(8c^4x^4+10c^3x^3-16c^2x^2-25cx+8\right)-512abcx\left(3c^4x^4-10c^2x^2+15\right)\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*e*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a^
2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*ArcSin[c*x]^2*(-10*b*Cos[3*ArcSin[c*x]] - 2*b*Cos[5*ArcSin[c*x]] + 5*
(12*a - 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x
]])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]] + 4000
*b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] + 288*b^2*Cos[5*ArcSi
n[c*x]] - 15*(-4800*b^2*Sqrt[1 - c^2*x^2] - 512*a*b*c*x*(15 - 10*c^2*x^2 +
3*c^4*x^4) + 480*a^2*Sqrt[1 - c^2*x^2]*(8 - 25*c*x - 16*c^2*x^2 + 10*c^3*x^
3 + 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSin[c*x]]))
- 60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(-1200*b*Cos[2*ArcSin[c*
x]] - 75*b*Cos[4*ArcSin[c*x]] - 4*(300*b*c*x - 480*a*Sqrt[1 - c^2*x^2] + 96
0*a*c^2*x^2*Sqrt[1 - c^2*x^2] - 480*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 600*a*Sin
[2*ArcSin[c*x]] + 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin[c*x]] + 6*b*S
```

```
in[5*ArcSin[c*x]]])))/(288000*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.256, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{5}{2}} (-cex+e)^{\frac{3}{2}} (a+b\arcsin (cx))^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\left(a^2c^3d^2ex^3+a^2c^2d^2ex^2-a^2cd^2ex-a^2d^2e+\left(b^2c^3d^2ex^3+b^2c^2d^2ex^2-b^2cd^2ex-b^2d^2e\right)\arcsin(cx)^2+2\left(abc^3\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^3*d^2*e*x^3 + a^2*c^2*d^2*e*x^2 - a^2*c*d^2*e*x - a^2*d^2*
e + (b^2*c^3*d^2*e*x^3 + b^2*c^2*d^2*e*x^2 - b^2*c*d^2*e*x - b^2*d^2*e)*arc
sin(c*x)^2 + 2*(a*b*c^3*d^2*e*x^3 + a*b*c^2*d^2*e*x^2 - a*b*c*d^2*e*x - a*b
*d^2*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{5}{2}}(-cex + e)^{\frac{3}{2}}(b \arcsin (cx) + a)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

3.547 $\int (d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=362

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{8bc\left(1-c^2x^2\right)^{3/2}}+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{8\left(1-c^2x^2\right)}+\frac{b\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex}{8c}$$

```
[Out] -(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/32 - (15*b^2*x*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (b*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (
3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*
x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*
(1 - c^2*x^2)^(3/2))
```

Rubi [A] time = 0.430885, antiderivative size = 362, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4673, 4649, 4647, 4641, 4627, 321, 216, 4677, 195}

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{8bc\left(1-c^2x^2\right)^{3/2}}+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{8\left(1-c^2x^2\right)}+\frac{b\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex}{8c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/32 - (15*b^2*x*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (b*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (
3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*
x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*
(1 - c^2*x^2)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
```

```
GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rubi steps

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(3(d+cdx)^{3/2}(e-cex)^{3/2}\right.}{4}$$

$$= \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin\right.}{8\left(1-c^2x^2\right)^{3/2}}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} - \frac{3bcx^2(}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} + \frac{9b^2(d}{}$$

Mathematica [A] time = 1.83932, size = 373, normalized size = 1.03

$$\frac{de\sqrt{cdx+d}\sqrt{e-cex}\left(-64a^2c^3x^3\sqrt{1-c^2x^2}+160a^2cx\sqrt{1-c^2x^2}+64ab\cos\left(2\sin^{-1}(cx)\right)+4ab\cos\left(4\sin^{-1}(cx)\right)-32b^2\sin\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*
e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqr
t[d]*Sqrt[e]*(-1 + c^2*x^2))] + 8*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Arc
Sin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]]) + d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c^3*x^
3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c*x]]
- 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[
c*x]] + 4*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c
^2*x^2])
```

Maple [F] time = 0.25, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}\left(a+b\arcsin(cx)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(a^2c^2dex^2 - a^2de + \left(b^2c^2dex^2 - b^2de\right)\arcsin(cx)^2 + 2\left(abc^2dex^2 - abde\right)\arcsin(cx)\right)\sqrt{cdx + d}\sqrt{-cex + e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*
e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{3}{2}}(-cex + e)^{\frac{3}{2}}(b\arcsin(cx) + a)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

3.548 $\int \sqrt{d+cdx}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=455

$$\frac{2bc^2ex^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}-\frac{bcex^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{2bex\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin\right.}{3\sqrt{1-c^2x^2}}$$

```
[Out] (-4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*e*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/4 - (2*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
))/(27*c) + (b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
 - c^2*x^2]) - (2*b*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
)/(3*Sqrt[1 - c^2*x^2]) - (b*c*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b
*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (2*b*c^2*e*x^3*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (e*x*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.591805, antiderivative size = 455, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {4673, 4763, 4647, 4641, 4627, 321, 216, 4677, 4645, 444, 43}

$$\frac{2bc^2ex^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}-\frac{bcex^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{2bex\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin\right.}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*e*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/4 - (2*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
))/(27*c) + (b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
 - c^2*x^2]) - (2*b*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
)/(3*Sqrt[1 - c^2*x^2]) - (b*c*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b
*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (2*b*c^2*e*x^3*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (e*x*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \sqrt{d+cdx}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int (e-cex)\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(e\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2 - cex\sqrt{1-c^2x^2}\left(a+\right.\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(e\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(ce\sqrt{d+cdx}\sqrt{\right.}{}$$

$$= \frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{e\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)}{3c}$$

$$= -\frac{2bex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{bcex^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+\right.}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex} - \frac{2bex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{b}{}$$

$$= -\frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2e\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{4c\sqrt{1-c^2x^2}} - \frac{2bex\sqrt{d+}}{}$$

$$= -\frac{4b^2e\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex} - \frac{2b^2e\sqrt{d+cdx}\sqrt{e-}}{27c}$$

Mathematica [A] time = 1.80815, size = 440, normalized size = 0.97

$$\frac{e\sqrt{cdx+d}\sqrt{e-cex}\left(-3\left(4\left(3a^2\sqrt{1-c^2x^2}\left(2c^2x^2-3cx-2\right)-4abcx\left(c^2x^2-3\right)+9b^2\sqrt{1-c^2x^2}\right)+9b^2\sin\left(2\sin^{-1}(cx)\right)\right)+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (36*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*Sqrt[d]*e
^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt
[d]*Sqrt[e]*(-1 + c^2*x^2))] + 18*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSi
n[c*x]^2*(6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] + 3*b*Sin[2*Ar
cSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(54*a*b*Cos[2*ArcSin[c*x]]
- 4*b^2*Cos[3*ArcSin[c*x]] - 3*(4*(9*b^2*Sqrt[1 - c^2*x^2] - 4*a*b*c*x*(-3
+ c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 - 3*c*x + 2*c^2*x^2)) + 9*b^2*Sin[
2*ArcSin[c*x]])) - 6*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(-9*b*
Cos[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^2*x^2*Sqr
t[1 - c^2*x^2] - 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))/(216*c*Sq
rt[1 - c^2*x^2])
```

Maple [F] time = 0.267, size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\,(-cex+e)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\left(a^2cex-a^2e+\left(b^2cex-b^2e\right)\arcsin(cx)^2+2\,(abcex-abe)\arcsin(cx)\right)\sqrt{cdx+d}\sqrt{-cex+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

3.549 $\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=398

$$\frac{e^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{2bc\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{bce^2x^2\sqrt{1-c^2}}{2\sqrt{cdx}}$$

```
[Out] (-4*b^2*e^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*e^2*x
*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*e^2*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (4*b*e^2*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*
e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]) - (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]) + (e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*
c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.577501, antiderivative size = 398, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4673, 4773, 3317, 3296, 2638, 3311, 32, 2635, 8}

$$\frac{e^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{2bc\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{bce^2x^2\sqrt{1-c^2}}{2\sqrt{cdx}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```


```
[Out] (-4*b^2*e^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*e^2*x
*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*e^2*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (4*b*e^2*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*
e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]) - (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]) + (e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*
c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3317

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 2638

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3311

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[(d*m*(c + d*x)^(m - 1)*(b*Sin[e + f*x])^n)/(f^2*n^2), x] + (Dist
[(b^2*(n - 1))/n, Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[(
d^2*m*(m - 1))/(f^2*n^2), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[(b*(c + d*x)^m*Cos[e + f*x]*(b*Sin[e + f*x])^(n - 1))/(f*n), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2(ce-ce\sin(x))^2\,dx, x, \sin^{-1}(cx)\right)}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int \left(c^2e^2(a+bx)^2 - 2c^2e^2(a+bx)^2\sin(x) + c^2e^2(a+bx)^2\sin^2(\right.\right.}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{e^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(e^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^2(x)\,dx, x\right.}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{bce^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{e^2x\left(1-\right.}{2}$$

$$= \frac{b^2e^2x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4be^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bce^2x^2\sqrt{1-c^2x^2}\left(a+\right.}{2\sqrt{d+cdx}\sqrt{e}}$$

$$= -\frac{4b^2e^2\left(1-c^2x^2\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{b^2e^2x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b^2e^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4be^2x}{}$$

Mathematica [A] time = 2.23658, size = 358, normalized size = 0.9

$$\frac{e\sqrt{cdx+d}\sqrt{e-cex}\left(-4\left(a^2(cx-4)\sqrt{1-c^2x^2}+8abcx+8b^2\sqrt{1-c^2x^2}\right)-2ab\cos\left(2\sin^{-1}(cx)\right)+b^2\sin\left(2\sin^{-1}(cx)\right)\right)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*e^(
3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d
]*Sqrt[e]*(-1 + c^2*x^2))] - 2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c
*x]*(16*b*c*x + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]) +
2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(6*a + 8*b*Sqrt[1 - c^2
*x^2] - b*Sin[2*ArcSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4*(8*a*
b*c*x + 8*b^2*Sqrt[1 - c^2*x^2] + a^2*(-4 + c*x)*Sqrt[1 - c^2*x^2]) - 2*a*b
*Cos[2*ArcSin[c*x]] + b^2*Sin[2*ArcSin[c*x]]))/(8*c*d*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.262, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2(-cex+e)^{\frac{3}{2}}\frac{1}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2cex - a^2e + \left(b^2cex - b^2e\right)\arcsin\left(cx\right)^2 + 2\left(abcex - abe\right)\arcsin\left(cx\right)\right)\sqrt{-cex + e}}{\sqrt{cdx + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(-c*e*x + e)/sqrt(c*d*x + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-cex + e)^{\frac{3}{2}}(b\arcsin\left(cx\right) + a)^2}{\sqrt{cdx + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

3.550 $\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=714

$$\frac{8ib^2e^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{8ib^2e^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2e^3\left(1-c^2x^2\right)^{3/2}\text{Pol}}{c(cdx+d)^{3/2}}$$

```
[Out] (2*a*b*e^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b^2*e^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (2*b^2
*e^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (4*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)) + (4*e^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^
(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x
])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^
2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
 ((16*I)*b*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*e^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) + ((8*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^
(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*e^3*
(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) - ((4*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)
*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 1.08485, antiderivative size = 714, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.469, Rules used = {4673, 4775, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181, 4641, 4619, 261}

$$\frac{8ib^2e^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{8ib^2e^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2e^3\left(1-c^2x^2\right)^{3/2}\text{Pol}}{c(cdx+d)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```


```
[Out] (2*a*b*e^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b^2*e^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (2*b^2
*e^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (4*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)) + (4*e^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^
(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x
])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^
2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
 ((16*I)*b*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*e^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) + ((8*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^
(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*e^3*
(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) - ((4*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)
*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int\left(\frac{4\left(e^3-ce^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{3e^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{ce^3x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(e^3-ce^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(3e^3\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4\left(1-c^2\right.\right.}{}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3\left(1-c^2x^2\right)^{3/2}\left(a+b\right.}{bc(d+cdx)^{3/2}(e-\right.}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3\left(1-c^2x^2\right)\left(a+b\sin\right.}{c(d+cdx)^{3/2}(e-cex}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [A] time = 7.32786, size = 1086, normalized size = 1.52

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (-3*a^2*e*(5 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 9*a^2*Sqrt[d]*e^(3/2)*(1 + c*x)*Sqrt
[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]
*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 3*a*b*e*(1 +
c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*(4 +
ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4 + Arc
Sin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin
[ArcSin[c*x]/2]) - b^2*e*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((6 + 6*
I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) + ArcSin[c*x]^
3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - (4*I)
*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) -
12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*L
```

```
og[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])) - 6*a*b*e*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x
 + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2]
 + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b^2*e*(1 + c*x)*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - I*c*x - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*(Sqrt[1 - c^2*x^2] + 4*Pi*
Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 4*Pi*Lo
g[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*ArcSin[c*x]^2*(((2 + 2*I) + Sqrt[
1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + ((-2 + 2*I) + Sqrt[1 - c^2*x^2])*Sin[Arc
Sin[c*x]/2])))/(3*c*d^2*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2]))
```

Maple [F] time = 0.201, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 (-cex+e)^{\frac{3}{2}} (cdx+d)^{-\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2cex-a^2e+\left(b^2cex-b^2e\right)\arcsin(cx)^2+2\,(abcex-abe)\arcsin(cx)\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^2d^2x^2+2\,cd^2x+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d^2*x^2 +
```

```
2*c*d^2*x + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

3.551 $\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=544

$$\frac{32ib^2e^4\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{8ie^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right.}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[Out] (((8*I)/3)*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(3
*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b^2*e^4*(1 - c^2*x^2)^(5/2)*
Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*e
^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^4*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e
*x)^(5/2)) - (2*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + Ar
cSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (32*b*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I
*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((32*I)/3)*b^2
*e^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.15426, antiderivative size = 544, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4673, 4775, 4641, 4773, 3318, 4186, 3767, 8, 4184, 3717, 2190, 2279, 2391}

$$\frac{32ib^2e^4\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{8ie^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right.}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (((8*I)/3)*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(3
*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b^2*e^4*(1 - c^2*x^2)^(5/2)*
Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*e
^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^4*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e
*x)^(5/2)) - (2*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + Ar
cSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (32*b*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I
*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((32*I)/3)*b^2
*e^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3318

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1*(e + (Pi*a)/(2*b)))/2 +
 (f*x)/2]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 4186

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> -Simp[(b^2*(c + d*x)^m*Cot[e + f*x]*(b*Csc[e + f*x])^(n - 2))/(f*(n -
 1)), x] + (Dist[(b^2*d^2*m*(m - 1))/(f^2*(n - 1)*(n - 2)), Int[(c + d*x)^(
m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[(b^2*(n - 2))/(n - 1), Int[(
c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[(b^2*d*m*(c + d*x)^(m -
1)*(b*Csc[e + f*x])^(n - 2))/(f^2*(n - 1)*(n - 2)), x]) /; FreeQ[{b, c, d,
e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4184

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> -Sim
p[((c + d*x)^m*Cot[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Co
t[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
```

```
x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(e-cex)^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{e^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}+\frac{4e^4\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)^2\sqrt{1-c^2x^2}}-\frac{4e^4\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e^4\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(4e^4\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}-$$

$$= \frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{\left(4e^4\left(1-c^2x^2\right)^{5/2}\right)\mathrm{Subst}\left(\int \frac{(a+bx)^2}{c+c\sin(x)}\,dx,x,\right.}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(e^4\left(1-c^2x^2\right)^{5/2}\right)\mathrm{Subst}\left(\int (a+bx)^2\csc^4\left(\right.\right.}{c(d+cdx)^{5/2}(e-cex)}$$

$$= \frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{4e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\cot\left(\frac{\pi}{4}\right.}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{4ie^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{8e^4\left(\right.}{}$$

$$= \frac{8ie^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{8b^2e}{}$$

$$= \frac{8ie^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{8b^2e}{}$$

$$= \frac{8ie^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{8b^2e}{}$$

$$= \frac{8ie^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{8b^2e}{}$$

Mathematica [B] time = 9.5937, size = 1430, normalized size = 2.63

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((-4*a^2*e)/(3*d^3*(1 + c*x)^2) +
(8*a^2*e)/(3*d^3*(1 + c*x))))/c - (a^2*e^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 + c
*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*d^(5/2
)) - (a*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[c*
x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + C
os[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4*ArcSin[c*x] + 6*ArcSin[c*x]^2 +
 Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*ArcSin[c*x]) - 28*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]])*Sin[ArcSin[c*x]/2]))/(6*c*d^3*(-1 + c*x)*Sqrt[-((d + c*d*x)*(e - c*e*x
))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (a*b*e*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[
c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] +
Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[Ar
cSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*
x^2]*ArcSin[c*x] - 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sqrt[
1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/
2]))/(3*c*d^3*(-1 + c*x)*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/
2] + Sin[ArcSin[c*x]/2])^4) - (b^2*e*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-I)*Pi*ArcSin[c*x] + (1 + I)*ArcSin[c*x]^
2 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1 - I*E
^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi + 2*Arc
Sin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^2*Si
n[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 - (2*ArcSin[c
*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (2*(-4
 + ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2])))/(3*c*d^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[Arc
Sin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) + (b^2*e*(-1 + c*x)*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((7*I)*Pi*ArcSin[c*x] - (7 + 7*I)*
ArcSin[c*x]^2 - ArcSin[c*x]^3 + 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(P
i + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 28*Pi*Log[Cos[ArcSin[c*x]
/2]] - 14*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (28*I)*PolyLog[2, I*E^(I*Ar
cSin[c*x])] - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2]
 + Sin[ArcSin[c*x]/2])^2 + (2*(-4 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(C
os[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[-((d + c*d*x)*(e -
c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2)
```

Maple [F] time = 0.204, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (-cex + e)^{\frac{3}{2}} (cdx + d)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2cex - a^2e + \left(b^2cex - b^2e\right)\arcsin\left(cx\right)^2 + 2\left(abcex - abe\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^3d^3x^3 + 3\,c^2d^3x^2 + 3\,cd^3x + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^3*x^3 +
3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-cex + e)^{\frac{3}{2}}(b\arcsin\left(cx\right) + a)^2}{(cdx + d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

3.552 $\int (d+cdx)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=502

$$\frac{5(cdx+d)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{48bc\left(1-c^2x^2\right)^{5/2}}+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{24\left(1-c^2x^2\right)}+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}\left(a\right.}{16\left(1-c^2x^2\right)^2}$$

```
[Out] -(b^2*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))/108 - (245*b^2*x*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2))/(1152*(1 - c^2*x^2)^2) - (65*b^2*x*(d + c*d*x)^(5/2
)*(e - c*e*x)^(5/2))/(1728*(1 - c^2*x^2)) + (115*b^2*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)*ArcSin[c*x])/(1152*c*(1 - c^2*x^2)^(5/2)) - (5*b*c*x^2*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^(5/2))
 + (5*b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(48*c*Sqrt
[1 - c^2*x^2]) + (b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/(18*c) + (x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*
ArcSin[c*x])^2)/6 + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[
c*x])^2)/(16*(1 - c^2*x^2)^2) + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a
 + b*ArcSin[c*x])^2)/(24*(1 - c^2*x^2)) + (5*(d + c*d*x)^(5/2)*(e - c*e*x)^
(5/2)*(a + b*ArcSin[c*x])^3)/(48*b*c*(1 - c^2*x^2)^(5/2))
```

Rubi [A] time = 0.567899, antiderivative size = 502, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4673, 4649, 4647, 4641, 4627, 321, 216, 4677, 195}

$$\frac{5(cdx+d)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{48bc\left(1-c^2x^2\right)^{5/2}}+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{24\left(1-c^2x^2\right)}+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}\left(a\right.}{16\left(1-c^2x^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```



```
[Out] -(b^2*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))/108 - (245*b^2*x*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2))/(1152*(1 - c^2*x^2)^2) - (65*b^2*x*(d + c*d*x)^(5/2
)*(e - c*e*x)^(5/2))/(1728*(1 - c^2*x^2)) + (115*b^2*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)*ArcSin[c*x])/(1152*c*(1 - c^2*x^2)^(5/2)) - (5*b*c*x^2*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^(5/2))
 + (5*b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(48*c*Sqrt
[1 - c^2*x^2]) + (b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/(18*c) + (x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*
ArcSin[c*x])^2)/6 + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[
c*x])^2)/(16*(1 - c^2*x^2)^2) + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a
 + b*ArcSin[c*x])^2)/(24*(1 - c^2*x^2)) + (5*(d + c*d*x)^(5/2)*(e - c*e*x)^
(5/2)*(a + b*ArcSin[c*x])^3)/(48*b*c*(1 - c^2*x^2)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
```

```
Denominator[p]])
```

Rubi steps

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{5/2}(e-cex)^{5/2}\right)\int \left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(5(d+cdx)^{5/2}(e-cex)^{5/2}\right.}{}$$

$$= \frac{b(d+cdx)^{5/2}(e-cex)^{5/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{18c} + \frac{1}{6}x(d+cdx)^{5/2}(e$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} + \frac{5b(d+cdx)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}\right.}{48c\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} - \frac{65b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1728\left(1-c^2x^2\right)} - \frac{5bcx^2}{}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} - \frac{245b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1152\left(1-c^2x^2\right)^2} - \frac{65b^2}{}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} - \frac{245b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1152\left(1-c^2x^2\right)^2} - \frac{65b^2}{}$$

Mathematica [A] time = 2.83636, size = 450, normalized size = 0.9

$$\frac{d^2e^2\left(\sqrt{cdx+d}\sqrt{e-cex}\left(2304a^2c^5x^5\sqrt{1-c^2x^2} - 7488a^2c^3x^3\sqrt{1-c^2x^2} + 9504a^2cx\sqrt{1-c^2x^2} + 3240ab\cos\left(2\sin^{-1}(cx)\right)\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*e^2*(1440*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2
*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x]*(270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] + 2*b*Co
s[6*ArcSin[c*x]] + 540*a*Sin[2*ArcSin[c*x]] + 108*a*Sin[4*ArcSin[c*x]] + 12
*a*Sin[6*ArcSin[c*x]]) + 72*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2
*(60*a + 45*b*Sin[2*ArcSin[c*x]] + 9*b*Sin[4*ArcSin[c*x]] + b*Sin[6*ArcSin[
c*x]]) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(9504*a^2*c*x*Sqrt[1 - c^2*x^2] -
7488*a^2*c^3*x^3*Sqrt[1 - c^2*x^2] + 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] + 3
240*a*b*Cos[2*ArcSin[c*x]] + 324*a*b*Cos[4*ArcSin[c*x]] + 24*a*b*Cos[6*ArcS
in[c*x]] - 1620*b^2*Sin[2*ArcSin[c*x]] - 81*b^2*Sin[4*ArcSin[c*x]] - 4*b^2*
Sin[6*ArcSin[c*x]])))/(13824*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.256, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}\left(a+b\arcsin(cx)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(a^2c^4d^2e^2x^4 - 2\,a^2c^2d^2e^2x^2 + a^2d^2e^2 + \left(b^2c^4d^2e^2x^4 - 2\,b^2c^2d^2e^2x^2 + b^2d^2e^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^4d^2e^2x^4 - \right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^4*d^2*e^2*x^4 - 2*a^2*c^2*d^2*e^2*x^2 + a^2*d^2*e^2 + (b^2*
c^4*d^2*e^2*x^4 - 2*b^2*c^2*d^2*e^2*x^2 + b^2*d^2*e^2)*arcsin(c*x)^2 + 2*(a
*b*c^4*d^2*e^2*x^4 - 2*a*b*c^2*d^2*e^2*x^2 + a*b*d^2*e^2)*arcsin(c*x))*sqrt
(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx + d)^{\frac{5}{2}}(-cex + e)^{\frac{5}{2}}(b\arcsin(cx) + a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

3.553 $\int (d+cdx)^{3/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=697

$$-\frac{2bc^4ex^5(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{25\left(1-c^2x^2\right)^{3/2}}+\frac{4bc^2ex^3(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15\left(1-c^2x^2\right)^{3/2}}-\frac{3bcex^2(cdx+d}{}$$

```
[Out] (-8*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*e*x*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2))/32 - (16*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2))/(75*c*(1 - c^2*x^2)) - (15*b^2*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)
)/(64*(1 - c^2*x^2)) - (2*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^
2*x^2))/(125*c) + (9*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])
/(64*c*(1 - c^2*x^2)^(3/2)) - (2*b*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*
(a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*e*x^2*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (4*b*c^
2*e*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c
^2*x^2)^(3/2)) - (2*b*c^4*e*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*
ArcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*e*(d + c*d*x)^(3/2)*(e - c*e*x)
^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (e*x*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*e*x*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) + (e*(d + c*d*x)^(3
/2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (e*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^
(3/2))
```

Rubi [A] time = 0.793676, antiderivative size = 697, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.469, Rules used = {4673, 4763, 4649, 4647, 4641, 4627, 321, 216, 4677, 195, 194, 4645, 12, 1247, 698}

$$-\frac{2bc^4ex^5(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{25\left(1-c^2x^2\right)^{3/2}}+\frac{4bc^2ex^3(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15\left(1-c^2x^2\right)^{3/2}}-\frac{3bcex^2(cdx+d}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-8*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*e*x*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2))/32 - (16*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2))/(75*c*(1 - c^2*x^2)) - (15*b^2*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)
)/(64*(1 - c^2*x^2)) - (2*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^
2*x^2))/(125*c) + (9*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])
/(64*c*(1 - c^2*x^2)^(3/2)) - (2*b*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*
(a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*e*x^2*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (4*b*c^
2*e*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c
^2*x^2)^(3/2)) - (2*b*c^4*e*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*
ArcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*e*(d + c*d*x)^(3/2)*(e - c*e*x)
^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (e*x*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*e*x*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) + (e*(d + c*d*x)^(3
/2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (e*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^
(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
 GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int (e-cex)\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(e\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 - cex\left(1-\right.\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left(e(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\left(1-c^2x^2\right)^{3/2}} - \frac{\left(ce(d\right.}{}$$

$$= \frac{1}{4}ex(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{e(d+cdx)^{3/2}(e-cex)^{3/2}}{}$$

$$= -\frac{2bex(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5\left(1-c^2x^2\right)^{3/2}} + \frac{4bc^2ex^3(d+cdx)^{3/2}(e}{15(1}$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{2bex(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin\right.}{5\left(1-c^2x^2\right)^{3/2}}$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} - \frac{2bex}{}$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} + \frac{9b^2e}{}$$

$$= -\frac{8b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{225c} - \frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{16b^2e(}{}$$

Mathematica [A] time = 3.66689, size = 574, normalized size = 0.82

$$\frac{de^2\left(\sqrt{cdx+d}\sqrt{e-cex}\left(-15\left(-480a^2\sqrt{1-c^2x^2}\left(8c^4x^4-10c^3x^3-16c^2x^2+25cx+8\right)+512abcx\left(3c^4x^4-10c^2x^2+15\right)+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*e^2*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a^
2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*ArcSin[c*x]^2*(10*b*Cos[3*ArcSin[c*x]] + 2*b*Cos[5*ArcSin[c*x]] + 5*(
12*a + 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]
])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]] - 4000*
b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Cos[5*ArcSin
[c*x]] - 15*(4800*b^2*Sqrt[1 - c^2*x^2] + 512*a*b*c*x*(15 - 10*c^2*x^2 + 3*
c^4*x^4) - 480*a^2*Sqrt[1 - c^2*x^2]*(8 + 25*c*x - 16*c^2*x^2 - 10*c^3*x^3
+ 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSin[c*x]])) +
60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(1200*b*Cos[2*ArcSin[c*x]]
 + 75*b*Cos[4*ArcSin[c*x]] + 4*(-300*b*c*x + 480*a*Sqrt[1 - c^2*x^2] - 960*
a*c^2*x^2*Sqrt[1 - c^2*x^2] + 480*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 600*a*Sin[2
*ArcSin[c*x]] - 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin[c*x]] - 6*b*Sin
```

```
[5*ArcSin[c*x]]))))/(288000*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.259, size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}} (-cex+e)^{\frac{5}{2}} (a+b\arcsin(cx))^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(a^2c^3de^2x^3 - a^2c^2de^2x^2 - a^2cde^2x + a^2de^2 + \left(b^2c^3de^2x^3 - b^2c^2de^2x^2 - b^2cde^2x + b^2de^2\right)\arcsin(cx)^2 + 2\left(abc\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^3*d*e^2*x^3 - a^2*c^2*d*e^2*x^2 - a^2*c*d*e^2*x + a^2*d*e^2
 + (b^2*c^3*d*e^2*x^3 - b^2*c^2*d*e^2*x^2 - b^2*c*d*e^2*x + b^2*d*e^2)*arcs
in(c*x)^2 + 2*(a*b*c^3*d*e^2*x^3 - a*b*c^2*d*e^2*x^2 - a*b*c*d*e^2*x + a*b*
d*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

3.554 $\int \sqrt{d+cdx}(e-cex)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=613

$$-\frac{bc^3e^2x^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{1}{4}c^2e^2x^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2+\frac{4bc^2e^2x^3\sqrt{cdx+d}\sqrt{e-}}{9\sqrt{1-}}$$

```
[Out] (-8*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*e^2*x*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])/32 - (4*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c)
+ (15*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c
^2*x^2]) - (4*b*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/
(3*Sqrt[1 - c^2*x^2]) - (3*b*c*e^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
 b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) + (4*b*c^2*e^2*x^3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*e^2*x^4*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2])
+ (3*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*
e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 + (2*e^2*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
 (5*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt
[1 - c^2*x^2])
```

Rubi [A] time = 1.00345, antiderivative size = 613, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4673, 4763, 4647, 4641, 4627, 321, 216, 4677, 4645, 444, 43, 4697, 4707}

$$-\frac{bc^3e^2x^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{1}{4}c^2e^2x^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2+\frac{4bc^2e^2x^3\sqrt{cdx+d}\sqrt{e-}}{9\sqrt{1-}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-8*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*e^2*x*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])/32 - (4*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c)
+ (15*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c
^2*x^2]) - (4*b*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/
(3*Sqrt[1 - c^2*x^2]) - (3*b*c*e^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
 b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) + (4*b*c^2*e^2*x^3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*e^2*x^4*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2])
+ (3*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*
e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 + (2*e^2*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
 (5*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt
[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
```

```
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rubi steps

$$\int \sqrt{d+cdx}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int (e-cex)^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(e^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2 - 2ce^2x\sqrt{1-c^2x^2}\,(\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(2ce^2\sqrt{d+cd\right.}{}$$

$$= \frac{1}{2}e^2x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}\,(a$$

$$= -\frac{4be^2x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{bce^2x^2\sqrt{d+cdx}\sqrt{e-cex}\,(a}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex} - \frac{4be^2x\sqrt{d+}}{}$$

$$= -\frac{15}{64}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2e^2\sqrt{d+}}{}$$

$$= -\frac{8b^2e^2\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{15}{64}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2e^2x^3\sqrt{d-}$$

Mathematica [A] time = 2.3294, size = 555, normalized size = 0.91

$$\frac{e^2\sqrt{cdx+d}\sqrt{e-cex}\left(3\left(576a^2c^3x^3\sqrt{1-c^2x^2} - 1536a^2c^2x^2\sqrt{1-c^2x^2} + 864a^2cx\sqrt{1-c^2x^2} + 1536a^2\sqrt{1-c^2x^2} + 1024abc^3\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (1440*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*Sqrt
[d]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/
(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt[1 -
 c^2*x^2] - 144*b*Cos[2*ArcSin[c*x]] + 9*b*Cos[4*ArcSin[c*x]] - 288*a*Sin[2
*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] + 36*a*Sin[4*ArcSin[c*x]]) + 72*b*e
^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(60*a + 48*b*Sqrt[1 - c^2*
x^2] + 16*b*Cos[3*ArcSin[c*x]] + 24*b*Sin[2*ArcSin[c*x]] - 3*b*Sin[4*ArcSin
[c*x]]) + e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*ArcSin[c*x]]
- 256*b^2*Cos[3*ArcSin[c*x]] + 3*(-3072*a*b*c*x + 1024*a*b*c^3*x^3 + 1536*a
^2*Sqrt[1 - c^2*x^2] - 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*Sqrt[1 - c^
2*x^2] - 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*Sqrt[1 - c^2*
x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]] + 9*b^2*Sin[4
*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.275, size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\,(-cex+e)^{\frac{5}{2}}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(a^2c^2e^2x^2 - 2\,a^2ce^2x + a^2e^2 + \left(b^2c^2e^2x^2 - 2\,b^2ce^2x + b^2e^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^2e^2x^2 - 2\,abce^2x + abe^2\right)\text{arc}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx + d}(-cex + e)^{\frac{5}{2}}(b\arcsin\left(cx\right) + a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

3.555 $\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=559

$$\frac{5e^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{cdx+d}\sqrt{e-cex}}+\frac{ce^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{3e^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{11e^3\left(1-c^2x\right.}{3c\sqrt{cd}}$$

```
[Out] (-68*b^2*e^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*
e^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*e^3*(1 -
c^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*e^3*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (22*b*e^3*x*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (
3*b*c*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (2*b*c^2*e^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (11*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*e^3*x*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (c*e^3*x^2*(1 - c^2*x
^2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*e^3*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
])
```

Rubi [A] time = 0.687553, antiderivative size = 559, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4673, 4773, 3317, 3296, 2638, 3311, 32, 2635, 8, 2633}

$$\frac{5e^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{cdx+d}\sqrt{e-cex}}+\frac{ce^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{3e^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{11e^3\left(1-c^2x\right.}{3c\sqrt{cd}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```


```
[Out] (-68*b^2*e^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*
e^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*e^3*(1 -
c^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*e^3*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (22*b*e^3*x*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (
3*b*c*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (2*b*c^2*e^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (11*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*e^3*x*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (c*e^3*x^2*(1 - c^2*x
^2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*e^3*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3317

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 2638

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3311

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[(d*m*(c + d*x)^(m - 1)*(b*Sin[e + f*x])^n)/(f^2*n^2), x] + (Dist
[(b^2*(n - 1))/n, Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[(
d^2*m*(m - 1))/(f^2*n^2), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[(b*(c + d*x)^m*Cos[e + f*x]*(b*Sin[e + f*x])^(n - 1))/(f*n), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rubi steps

$$\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2(ce-ce\sin(x))^3\,dx, x, \sin^{-1}(cx)\right)}{c^4\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int \left(c^3e^3(a+bx)^2 - 3c^3e^3(a+bx)^2\sin(x) + 3c^3e^3(a+bx)^2\sin^2(x)\right.\right.}{c^4\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{e^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^3(x)\,dx, x, \text{si}\right.}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{3bce^3x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2bc^2e^3x^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3e^3(1}{}$$

$$= \frac{3b^2e^3x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{6be^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3bce^3x^2\sqrt{1-c^2x^2}\left(a+b\right.}{2\sqrt{d+cdx}\sqrt{e-}}$$

$$= -\frac{56b^2e^3\left(1-c^2x^2\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2e^3x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3b^2e^3\sqrt{1-}}{4c\sqrt{d+}}$$

$$= -\frac{68b^2e^3\left(1-c^2x^2\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2e^3x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3b^2e^3\sqrt{1-}}{4c\sqrt{d+}}$$

Mathematica [A] time = 3.26264, size = 473, normalized size = 0.85

$$\frac{e^2\sqrt{cdx+d}\sqrt{e-cex}\left(72a^2c^2x^2\sqrt{1-c^2x^2} - 324a^2cx\sqrt{1-c^2x^2} + 792a^2\sqrt{1-c^2x^2} - 1620abcx + 12ab\sin\left(3\sin^{-1}(cx)\right) - 16\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (180*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 540*a^2*Sqrt[d
]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 6*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*A
rcSin[c*x]*(264*b*c*x + 8*b*c^3*x^3 - 270*a*Sqrt[1 - c^2*x^2] + 108*a*c*x*S
qrt[1 - c^2*x^2] + 27*b*Cos[2*ArcSin[c*x]] + 6*a*Cos[3*ArcSin[c*x]]) + 18*b
*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(30*a + 45*b*Sqrt[1 - c^
2*x^2] - b*Cos[3*ArcSin[c*x]] - 9*b*Sin[2*ArcSin[c*x]]) + e^2*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(-1620*a*b*c*x + 792*a^2*Sqrt[1 - c^2*x^2] - 1620*b^2*Sq
rt[1 - c^2*x^2] - 324*a^2*c*x*Sqrt[1 - c^2*x^2] + 72*a^2*c^2*x^2*Sqrt[1 - c
^2*x^2] - 162*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] + 81*b^2*Si
n[2*ArcSin[c*x]] + 12*a*b*Sin[3*ArcSin[c*x]]))/(216*c*d*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.266, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2(-cex+e)^{\frac{5}{2}}\frac{1}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^2e^2x^2 - 2\,a^2ce^2x + a^2e^2 + \left(b^2c^2e^2x^2 - 2\,b^2ce^2x + b^2e^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^2e^2x^2 - 2\,abce^2x + abe^2\right)\text{arc}}{\sqrt{cdx + d}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(-c*e*x + e)/sqrt(c*d*x + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(-cex + e)^{\frac{5}{2}}(b\arcsin(cx) + a)^2}{\sqrt{cdx + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

3.556 $\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=918

$$-\frac{5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3e^4}{2bc(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{b^2x\left(1-c^2x^2\right)^2e^4}{4(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{8b^2\left(1-c^2x^2\right)^2e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(c\right.}{2(cxd+d)^{3/2}(e-cex)^{3/}}$$

```
[Out] (8*a*b*e^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
8*b^2*e^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*e
^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*e^4*(1
 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
(8*b^2*e^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x
)^(3/2)) - (b*c*e^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - (8*e^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*e^4*x*(1 - c^2*x^2)*(a + b*Ar
cSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*e^4*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(4*e^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e
*x)^(3/2)) + (e^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^(
3/2)*(e - c*e*x)^(3/2)) - (5*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3)
/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((32*I)*b*e^4*(1 - c^2*x^2)^
(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) + (16*b*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1
 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I
)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*I)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLo
g[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)
*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 1.27257, antiderivative size = 918, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 19, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.594, Rules used = {4673, 4775, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181, 4641, 4619, 261, 4707, 4627, 321, 216}

$$-\frac{5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3e^4}{2bc(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{b^2x\left(1-c^2x^2\right)^2e^4}{4(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{8b^2\left(1-c^2x^2\right)^2e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(c\right.}{2(cxd+d)^{3/2}(e-cex)^{3/}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```


```
[Out] (8*a*b*e^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
8*b^2*e^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*e
^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*e^4*(1
 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
(8*b^2*e^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x
)^(3/2)) - (b*c*e^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - (8*e^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*e^4*x*(1 - c^2*x^2)*(a + b*Ar
cSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*e^4*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(4*e^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e
*x)^(3/2)) + (e^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^(
```

```
3/2)*(e - c*e*x)^(3/2)) - (5*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3)
/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((32*I)*b*e^4*(1 - c^2*x^2)^
(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) + (16*b*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1
 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I
)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*I)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLo
g[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)
*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{8\left(e^4-ce^4x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{7e^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{4ce^4x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \frac{c^2e^4x}{}\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(8\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(e^4-ce^4x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(7e^4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{4e^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{e^4x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{7e^4\left(1-\right.}{3bc(}$$

$$= \frac{8abe^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bce^4x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^4\left(1-c^2x^2\right)^2\left(a\right.}{c(d+cdx)^{3/2}}$$

$$= \frac{8abe^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{8abe^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2}{4}$$

$$= \frac{8abe^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2}{4}$$

$$= \frac{8abe^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2}{4}$$

$$= \frac{8abe^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2}{4}$$

$$= \frac{8abe^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2}{4}$$

Mathematica [B] time = 10.7667, size = 2279, normalized size = 2.48

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((-4*a^2*e^2)/d^2 + (a^2*c*e^2*x)/
(2*d^2) - (8*a^2*e^2)/(d^2*(1 + c*x))))/c + (15*a^2*e^(5/2)*ArcTan[(c*x*Sqr
t[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x)
)])/(2*c*d^(3/2)) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1
- c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4 + ArcSin[c*x])*ArcSin[c*x] -
8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(c*d^2
*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2])) - (4*a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e
*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-(c*x) + 2*ArcSin[c*x] + Sqrt[1 - c^2
*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2]]) + (-(c*x) - 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin
```

```
[c*x]^2 - 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2
]))/(c*d^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c
*x]/2] + Sin[ArcSin[c*x]/2])) - (b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sq
rt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*((-6*I)*Pi*ArcSin[c*x] + (6 +
6*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[c*x])] -
12*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] + 24*Pi*Log[Cos[ArcSin
[c*x]/2]] + 12*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + ((-6*I)*Pi*ArcSin[c*x
] - (6 - 6*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[
c*x])] - 12*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] + 24*Pi*Log[C
os[ArcSin[c*x]/2]] + 12*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*Sin[ArcSin[c*x
]/2] + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2])))/(3*c*d^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*
(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) - (2*b^2*e^2*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(3*Sqrt[1 - c^2
*x^2]*(-2 + ArcSin[c*x]^2) + 2*((-3*I)*Pi*ArcSin[c*x] - 3*c*x*ArcSin[c*x] +
 (3 + 3*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 12*Pi*Log[1 + E^((-I)*ArcSin[c*x
])] - 6*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 12*ArcSin[c*x]*Log[1 - I*E^(I*Arc
Sin[c*x])] + 12*Pi*Log[Cos[ArcSin[c*x]/2]] + 6*Pi*Log[Sin[(Pi + 2*ArcSin[c*
x])/4]])) + (3*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) + 2*((-3*I)*Pi*ArcSin
[c*x] - 3*c*x*ArcSin[c*x] - (3 - 3*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 12*Pi
*Log[1 + E^((-I)*ArcSin[c*x])] - 6*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 12*Arc
Sin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 12*Pi*Log[Cos[ArcSin[c*x]/2]] + 6*P
i*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]))*Sin[ArcSin[c*x]/2] + (24*I)*PolyLog[2,
 I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^2*
Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2])) - (b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1
 - c^2*x^2))]*((96*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]) + Sin[ArcSin[c*x]/2]*((-24*I)*Pi*ArcSin[c*x] - 48*c*x*
ArcSin[c*x] - (24 - 24*I)*ArcSin[c*x]^2 + 10*ArcSin[c*x]^3 + 3*Sqrt[1 - c^2
*x^2]*(-16 + c*x + 8*ArcSin[c*x]^2) - 3*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 96
*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 48*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 96
*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 96*Pi*Log[Cos[ArcSin[c*x]/2]] +
 48*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - 3*ArcSin[c*x]^2*Sin[2*ArcSin[c*x]
]) + Cos[ArcSin[c*x]/2]*((-24*I)*Pi*ArcSin[c*x] - 48*c*x*ArcSin[c*x] + (24
+ 24*I)*ArcSin[c*x]^2 + 10*ArcSin[c*x]^3 + 3*Sqrt[1 - c^2*x^2]*(-16 + c*x +
 8*ArcSin[c*x]^2) - 3*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 96*Pi*Log[1 + E^((-I
)*ArcSin[c*x])] - 48*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 96*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] + 96*Pi*Log[Cos[ArcSin[c*x]/2]] + 48*Pi*Log[Sin[(Pi
 + 2*ArcSin[c*x])/4]] - 3*ArcSin[c*x]^2*Sin[2*ArcSin[c*x]])))/(12*c*d^2*Sqr
t[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 -
c^2*x^2))]*((15 + 14*ArcSin[c*x])*Cos[(3*ArcSin[c*x])/2] - Cos[(5*ArcSin[c*
x])/2] + 2*ArcSin[c*x]*Cos[(5*ArcSin[c*x])/2] + 4*Cos[ArcSin[c*x]/2]*(-4 +
12*ArcSin[c*x] + 5*ArcSin[c*x]^2 - 16*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2]]) - 16*Sin[ArcSin[c*x]/2] - 48*ArcSin[c*x]*Sin[ArcSin[c*x]/2] + 20*A
rcSin[c*x]^2*Sin[ArcSin[c*x]/2] - 64*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]]*Sin[ArcSin[c*x]/2] - 15*Sin[(3*ArcSin[c*x])/2] + 14*ArcSin[c*x]*Sin[
(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2] - 2*ArcSin[c*x]*Sin[(5*ArcSin[c
*x])/2]))/(8*c*d^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F] time = 0.217, size = 0, normalized size = 0.

$$\int (a + b \arcsin(cx))^2 (-cex + e)^{\frac{5}{2}} (cdx + d)^{-\frac{3}{2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^2e^2x^2 - 2\,a^2ce^2x + a^2e^2 + \left(b^2c^2e^2x^2 - 2\,b^2ce^2x + b^2e^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^2e^2x^2 - 2\,abce^2x + abe^2\right)\arcsin}{c^2d^2x^2 + 2\,cd^2x + d^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d^2*x^2 + 2*c*
d^2*x + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-cex + e\right)^{\frac{5}{2}}\left(b \arcsin\left(cx\right) + a\right)^2}{\left(cdx + d\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

3.557 $\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=729

$$\frac{112ib^2e^5\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{5e^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{e^5\left(1-c^2\right.}{c(cd\ldots}$$

```
[Out] (-2*a*b*e^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
(2*b^2*e^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b^
2*e^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) + (((28*I)/3)*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*e^5*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (16*b^2*e^5
*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) + (28*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4
 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b*e^5*(1
- c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin
[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcS
in[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(
5/2)) + (((112*I)/3)*b^2*e^5*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.30321, antiderivative size = 729, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 16, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4673, 4775, 4641, 4677, 4619, 261, 4773, 3318, 4186, 3767, 8, 4184, 3717, 2190, 2279, 2391}

$$\frac{112ib^2e^5\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{5e^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{e^5\left(1-c^2\right.}{c(cd\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```


```
[Out] (-2*a*b*e^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
(2*b^2*e^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b^
2*e^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) + (((28*I)/3)*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*e^5*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (16*b^2*e^5
*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) + (28*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4
 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b*e^5*(1
- c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin
[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcS
in[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(
5/2)) + (((112*I)/3)*b^2*e^5*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3318

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1*(e + (Pi*a)/(2*b)))/2 +
 (f*x)/2]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 4186

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> -Simp[(b^2*(c + d*x)^m*Cot[e + f*x]*(b*Csc[e + f*x])^(n - 2))/(f*(n -
 1)), x] + (Dist[(b^2*d^2*m*(m - 1))/(f^2*(n - 1)*(n - 2)), Int[(c + d*x)^(
m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[(b^2*(n - 2))/(n - 1), Int[(
c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[(b^2*d*m*(c + d*x)^(m -
1)*(b*Csc[e + f*x])^(n - 2))/(f^2*(n - 1)*(n - 2)), x]) /; FreeQ[{b, c, d,
e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4184

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> -Sim
p[((c + d*x)^m*Cot[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Co
t[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(e-cex)^5\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int\left(\frac{5e^5\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \frac{ce^5x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{8e^5\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)^2\sqrt{1-c^2x^2}} - \frac{12e^5(a+b\cdots}{(1+cx)\cdots}\cdots}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(5e^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8e^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \cdots$$

$$= \frac{e^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(12e^5\left(\cdots\right.\right.}{\cdots}$$

$$= -\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5\left(1-c^2x^2\right)^{5/2}\cdots}{3bc(d+cdx)\cdots}$$

$$= -\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^5\left(1-c^2x^2\right)^3(a+b\cdots}{c(d+cdx)^{5/2}(e\cdots}$$

$$= -\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}\cdots}{(d+cdx)^{5/2}(e-cex)^{5/\cdots}}$$

$$= -\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}\cdots}{(d+cdx)^{5/2}(e-cex)^{5/\cdots}}$$

$$= -\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}\cdots}{(d+cdx)^{5/2}(e-cex)^{5/\cdots}}$$

$$= -\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}\cdots}{(d+cdx)^{5/2}(e-cex)^{5/\cdots}}$$

$$= -\frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}\cdots}{(d+cdx)^{5/2}(e-cex)^{5/\cdots}}$$

Mathematica [B] time = 12.4498, size = 2326, normalized size = 3.19

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((a^2*e^2)/d^3 - (8*a^2*e^2)/(3*d^
3*(1 + c*x)^2) + (28*a^2*e^2)/(3*d^3*(1 + c*x))))/c - (5*a^2*e^(5/2)*ArcTan
[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*
(1 + c*x))])/(c*d^(5/2)) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(
d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c
*x]/2]*(-8 + 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] +
Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[
c*x] + 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4*ArcSin[
c*x] + 6*ArcSin[c*x]^2 + Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*ArcSin[c*x]
) - 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[
-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) -
(a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[Ar
cSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2
```

```
*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*
ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + 2*A
rcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 4*Log[Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2]] - 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[-((d + c*d*x)*(e -
c*e*x))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (b^2*e^2*(-1 + c*x)
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-6*c*x*ArcSin
[c*x])/Sqrt[1 - c^2*x^2] + ((13 + 13*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] +
(3*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + 3*(-2 + ArcSin[c*x]^2) + (13*((-I)*Pi
*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*
Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[
(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]))/Sqrt[1 -
 c^2*x^2] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[Ar
cSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3) - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(
Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*(4 - 13
*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2]
+ Sin[ArcSin[c*x]/2]))))/(3*c*d^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[Arc
Sin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) - (b^2*e^2*(-1 + c*x)*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-I)*Pi*ArcSin[c*x] + (1 + I)*A
rcSin[c*x]^2 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*
Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[
(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*ArcSi
n[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 -
(2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])
^2 - (2*(-4 + ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^
2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) + (2*b^2*e^2*(-1 + c*x)*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((7*I)*Pi*ArcSin[c*
x] - (7 + 7*I)*ArcSin[c*x]^2 - ArcSin[c*x]^3 + 28*Pi*Log[1 + E^((-I)*ArcSin
[c*x])] + 14*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 28*Pi*Log[
Cos[ArcSin[c*x]/2]] - 14*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (28*I)*PolyL
og[2, I*E^(I*ArcSin[c*x])] - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (2*(-4 + 7*ArcSin[c*x]^2)*Sin[Arc
Sin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[-((d
 + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[
c*x]/2])^2) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*
x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(3*Cos[(5*ArcSin[c*x])/2]
- 3*ArcSin[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(-20 + 24*ArcSi
n[c*x] + 27*ArcSin[c*x]^2 - 156*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]
]) + Cos[(3*ArcSin[c*x])/2]*(9 + 35*ArcSin[c*x] - 9*ArcSin[c*x]^2 + 52*Log[
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 20*Sin[ArcSin[c*x]/2] - 24*ArcS
in[c*x]*Sin[ArcSin[c*x]/2] + 27*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] - 156*Log[
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[ArcSin[c*x]/2] - 9*Sin[(3*ArcS
in[c*x])/2] + 35*ArcSin[c*x]*Sin[(3*ArcSin[c*x])/2] + 9*ArcSin[c*x]^2*Sin[(
3*ArcSin[c*x])/2] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[(3*
ArcSin[c*x])/2] + 3*Sin[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Sin[(5*ArcSin[c*
x])/2]))/(6*c*d^3*(-1 + c*x)*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c
*x]/2] + Sin[ArcSin[c*x]/2])^4)
```

Maple [F] time = 0.204, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (-cex + e)^{\frac{5}{2}} (cdx + d)^{-\frac{5}{2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^2e^2x^2 - 2\,a^2ce^2x + a^2e^2 + \left(b^2c^2e^2x^2 - 2\,b^2ce^2x + b^2e^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^2e^2x^2 - 2\,abce^2x + abe^2\right)\text{arc}}{c^3d^3x^3 + 3\,c^2d^3x^2 + 3\,cd^3x + d^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^3*x^3 + 3*c^
2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-cex + e\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right) + a\right)^2}{\left(cdx + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

3.558 $\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx$

Optimal. Leaf size=559

$$\frac{5d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{cdx+d}\sqrt{e-cex}}-\frac{cd^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{3d^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}-\frac{11d^3\left(1-c^2\right.}{3c\sqrt{c}}$$

```
[Out] (68*b^2*d^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*d
^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*d^3*(1 - c
^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*d^3*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (22*b*d^3*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3
*b*c*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]) + (2*b*c^2*d^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - (11*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*d^3*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (c*d^3*x^2*(1 - c^2*x^
2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*d^3*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
)
```

Rubi [A] time = 0.659786, antiderivative size = 559, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4673, 4773, 3317, 3296, 2638, 3311, 32, 2635, 8, 2633}

$$\frac{5d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{cdx+d}\sqrt{e-cex}}-\frac{cd^3x^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{3d^3x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}-\frac{11d^3\left(1-c^2\right.}{3c\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```


```
[Out] (68*b^2*d^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*d
^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*d^3*(1 - c
^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*d^3*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (22*b*d^3*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3
*b*c*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]) + (2*b*c^2*d^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - (11*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*d^3*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (c*d^3*x^2*(1 - c^2*x^
2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*d^3*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
)
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3317

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 2638

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3311

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[(d*m*(c + d*x)^(m - 1)*(b*Sin[e + f*x])^n)/(f^2*n^2), x] + (Dist
[(b^2*(n - 1))/n, Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[(
d^2*m*(m - 1))/(f^2*n^2), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[(b*(c + d*x)^m*Cos[e + f*x]*(b*Sin[e + f*x])^(n - 1))/(f*n), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2(cd+cd\sin(x))^3\,dx, x, \sin^{-1}(cx)\right)}{c^4\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int \left(c^3d^3(a+bx)^2+3c^3d^3(a+bx)^2\sin(x)+3c^3d^3(a+bx)^2\sin^2(\right.\right.}{c^4\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^3(x)\,dx, x, \mathrm{s}\right.}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{3bcd^3x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3d^3}{}$$

$$= \frac{3b^2d^3x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{6bd^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}\left(a+\right.}{2\sqrt{d+cdx}\sqrt{e-}}$$

$$= \frac{56b^2d^3\left(1-c^2x^2\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2d^3x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3b^2d^3\sqrt{1-}}{4c\sqrt{d+}}$$

$$= \frac{68b^2d^3\left(1-c^2x^2\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2d^3x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3b^2d^3\sqrt{1-}}{4c\sqrt{d+}}$$

Mathematica [A] time = 3.5625, size = 434, normalized size = 0.78

$$-\frac{d^2\left(\sqrt{cdx+d}\sqrt{e-cex}\left(6\left(6a^2\sqrt{1-c^2x^2}\left(2c^2x^2+9cx+22\right)-8abcx\left(c^2x^2+33\right)-27b^2(cx+10)\sqrt{1-c^2x^2}\right)+162ab\cos\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] -(d^2*(-180*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 540*a^2*Sqr
t[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x]*(-18*b + 264*b*c*x + 36*b*c^2*x^2 + 8*b*c^3*x^3 - 270*a*Sqrt[1 -
c^2*x^2] - 108*a*c*x*Sqrt[1 - c^2*x^2] - 9*b*Cos[2*ArcSin[c*x]] + 6*a*Cos[3
*ArcSin[c*x]]) + 18*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(-30*a
+ 9*b*(5 + 2*c*x)*Sqrt[1 - c^2*x^2] - b*Cos[3*ArcSin[c*x]]) + Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(6*(-27*b^2*(10 + c*x)*Sqrt[1 - c^2*x^2] - 8*a*b*c*x*(33
 + c^2*x^2) + 6*a^2*Sqrt[1 - c^2*x^2]*(22 + 9*c*x + 2*c^2*x^2)) + 162*a*b*C
os[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]])))/(216*c*e*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.263, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 (cdx+d)^{\frac{5}{2}} \frac{1}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2d^2x^2 + 2\,a^2cd^2x + a^2d^2 + \left(b^2c^2d^2x^2 + 2\,b^2cd^2x + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^2d^2x^2 + 2\,abcd^2x + abd^2\right)\right.}{cex - e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x
+ a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c*e*x - e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx + d)^{\frac{5}{2}}(b\arcsin(cx) + a)^2}{\sqrt{-cex + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

3.559 $\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx$

Optimal. Leaf size=398

$$\frac{d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{2bc\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}}{2\sqrt{cdx+}}$$

```
[Out] (4*b^2*d^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*d^2*x*
(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*d^2*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*d^2*x*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*d
^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]) - (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.562053, antiderivative size = 398, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4673, 4773, 3317, 3296, 2638, 3311, 32, 2635, 8}

$$\frac{d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{2bc\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}}{2\sqrt{cdx+}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (4*b^2*d^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*d^2*x*
(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*d^2*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*d^2*x*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*d
^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]) - (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3317

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 2638

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3311

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[(d*m*(c + d*x)^(m - 1)*(b*Sin[e + f*x])^n)/(f^2*n^2), x] + (Dist
[(b^2*(n - 1))/n, Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[(
d^2*m*(m - 1))/(f^2*n^2), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[(b*(c + d*x)^m*Cos[e + f*x]*(b*Sin[e + f*x])^(n - 1))/(f*n), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2(cd+cd\sin(x))^2\,dx, x, \sin^{-1}(cx)\right)}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int \left(c^2d^2(a+bx)^2+2c^2d^2(a+bx)^2\sin(x)+c^2d^2(a+bx)^2\sin^2(x\right.\right.}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(d^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^2(x)\,dx, x, s\right.}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{bcd^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{d^2x\left(1-c\right.}{2\sqrt{}}$$

$$= \frac{b^2d^2x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4bd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bcd^2x^2\sqrt{1-c^2x^2}\left(a+b\right.}{2\sqrt{d+cdx}\sqrt{e-}}$$

$$= \frac{4b^2d^2\left(1-c^2x^2\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{b^2d^2x\left(1-c^2x^2\right)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b^2d^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4bd^2x\sqrt{1}}{\sqrt{}}$$

Mathematica [A] time = 2.15878, size = 344, normalized size = 0.86

$$\frac{d\sqrt{cdx+d}\sqrt{e-cex}\left(-2a^2(cx+4)\sqrt{1-c^2x^2}+16abcx-ab\cos\left(2\sin^{-1}(cx)\right)+b^2(cx+16)\sqrt{1-c^2x^2}\right)-6a^2d^{3/2}\sqrt{e}\sqrt{1-c^2}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4*a*(4 + c*x)*Sqrt[1 - c^2*x^2] + b*
(-1 + 16*c*x + 2*c^2*x^2))*ArcSin[c*x] - 2*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(-3*a + b*(4 + c*x)*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b^2*d*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 6*a^2*d^(3/2)*Sqrt[e]*Sqrt[1 - c^2*
x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^
2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(16*a*b*c*x - 2*a^2*(4 + c*x)*
Sqrt[1 - c^2*x^2] + b^2*(16 + c*x)*Sqrt[1 - c^2*x^2] - a*b*Cos[2*ArcSin[c*x
]]))/(4*c*e*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.265, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2(cdx+d)^{\frac{3}{2}}\frac{1}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2cdx + a^2d + \left(b^2cdx + b^2d\right)\arcsin\left(cx\right)^2 + 2\left(abcdx + abd\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cex + e}}{cex - e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c
*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c*e*x - e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cdx + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)^2}{\sqrt{-cex + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

3.560 $\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx$

Optimal. Leaf size=231

$$\frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2d\left(1-c^2x^2\right)}{c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-}}{\sqrt{cdx+}}$$

```
[Out] (2*a*b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*
(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*x*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (d*(1 - c^2*x^2)*(a
 + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (d*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.441645, antiderivative size = 231, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4673, 4763, 4641, 4677, 4619, 261}

$$\frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2d\left(1-c^2x^2\right)}{c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-}}{\sqrt{cdx+}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (2*a*b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*
(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*x*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (d*(1 - c^2*x^2)*(a
 + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (d*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}+\frac{cdx\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\left(d\sqrt{1-c^2x^2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(cd\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(2bd\sqrt{1-c^2x\right.}{\sqrt{d}}$$

$$= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{d\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{3bc\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-c^2x^2}\sin^{-1}(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2d\left(1-c^2x^2\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-c^2x^2}\sin^{-1}(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{d\left(1-c^2\right.}{c\sqrt{}}$$

Mathematica [A] time = 1.12721, size = 298, normalized size = 1.29

$$\frac{3\sqrt{cdx+d}\sqrt{e-cex}\left(a^2\left(-\sqrt{1-c^2x^2}\right)+2abcx+2b^2\sqrt{1-c^2x^2}\right)-3a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\left(c^2x^2-1\right)}\right)+3b\sqrt{cd}}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*a*b*c*x - a^2*Sqrt[1 - c^2*x^2] + 2*b
^2*Sqrt[1 - c^2*x^2]) + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(b*c*x - a*Sqrt
```

```
[1 - c^2*x^2])*ArcSin[c*x] + 3*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a - b*Sqr
t[1 - c^2*x^2])*ArcSin[c*x]^2 + b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[
c*x]^3 - 3*a^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))])/(3*c*e*Sqrt[1 - c^2*x
^2])
```

Maple [F] time = 0.273, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 \sqrt{cdx+d}\frac{1}{\sqrt{-cex+e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{cex-e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c*e*x - e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{d(cx+1)}\,(a+b\,\mathrm{asin}(cx))^2}{\sqrt{-e(cx-1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))**2/sqrt(-e*(c*x - 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cdx+d}(b \arcsin (cx)+a)^2}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

3.561 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=55

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rubi [A] time = 0.237506, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {4673, 4641}

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &= \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

Mathematica [B] time = 0.921061, size = 159, normalized size = 2.89

$$\frac{-\frac{3a^2\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\left(c^2x^2-1\right)}\right)}{\sqrt{d}\sqrt{e}}+\frac{3ab\sqrt{1-c^2x^2}\sin^{-1}(cx)^2}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)^3}{\sqrt{cdx+d}\sqrt{e-cex}}}{3c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
+ (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) -
 (3*a^2*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 +
 c^2*x^2))])/(Sqrt[d]*Sqrt[e]))/(3*c)
```

Maple [F] time = 0.24, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 \frac{1}{\sqrt{cdx+d}}\frac{1}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^2dex^2-de},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d*e*x^2 - d*e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\,\mathrm{asin}(cx))^2}{\sqrt{d(cx+1)}\sqrt{-e(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{\sqrt{cdx + d}\sqrt{-cex + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

3.562 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=455

$$\frac{2ib^2e\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2e\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2e\left(1-c^2x^2\right)^{3/2}\text{PolyLo}}{c(cdx+d)^{3/2}(e-}$$

```
[Out] -((e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2))) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) - (I*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
+ (2*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*
x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((2*I)*b^2*e*(1 - c^2*x^2)^
(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2)) - ((2*I)*b^2*e*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*e*(1 - c^2*x^2)^(3/2)*Poly
Log[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 0.671882, antiderivative size = 455, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {4673, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181}

$$\frac{2ib^2e\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2e\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2e\left(1-c^2x^2\right)^{3/2}\text{PolyLo}}{c(cdx+d)^{3/2}(e-}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]
```


```
[Out] -((e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2))) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) - (I*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
+ (2*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*
x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((2*I)*b^2*e*(1 - c^2*x^2)^
(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2)) - ((2*I)*b^2*e*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*e*(1 - c^2*x^2)^(3/2)*Poly
Log[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
```

```
b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{e\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}-\frac{cex\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(e\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(ce\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2be\left(1-c^2x^2\right)^{3/2}\right)\ldots}{(d+cdx)^{3/2}(e\ldots}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2be\left(1-c^2x^2\right)^{3/2}\right)\ldots}{c\ldots}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie\left(1-c^2x^2\right)^{3/2}\left(a+\ldots\right.}{c(d+cdx)^{3/2}(e\ldots}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie\left(1-c^2x^2\right)^{3/2}\left(a+\ldots\right.}{c(d+cdx)^{3/2}(e\ldots}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie\left(1-c^2x^2\right)^{3/2}\left(a+\ldots\right.}{c(d+cdx)^{3/2}(e\ldots}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie\left(1-c^2x^2\right)^{3/2}\left(a+\ldots\right.}{c(d+cdx)^{3/2}(e\ldots}$$

Mathematica [A] time = 1.726, size = 225, normalized size = 0.49

$$-\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{-i\sin^{-1}(cx)}\right)+a\left(acx-a+4b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{1}{4}\left(2\sin^{-1}(cx)+\pi\ldots\right.\right.\right.\right.\right.}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-(b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*(
-I + Cot[(Pi + 2*ArcSin[c*x])/4])) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(-(a
*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[1 + I/E^(I*ArcSin[c*x])]) + a*(-a +
 a*c*x + 4*b*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)/E^(I*ArcSin[c*x])]))/(c*d^2*e*(-1 + c*x
)*(1 + c*x)))
```

Maple [F] time = 0.267, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 (cdx+d)^{-\frac{3}{2}} \frac{1}{\sqrt{-cex+e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^3d^2ex^3+c^2d^2ex^2-cd^2ex-d^2e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^3*d^2*e*x^3 + c^2*d^2*e*x^2 - c*d^2*e*x - d^2*e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\,\mathrm{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}\sqrt{-e(cx-1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*sqrt(-e*(c*x - 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)), x)
```

3.563 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=896

$$\frac{c^2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2x^3}{3(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{bce^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)x^2}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2\left(1-c^2x^2\right)^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2e^2\left(1-c^2x^2\right)^2}{3(cxd+d}$$

```
[Out] (-2*b^2*e^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2
*b^2*e^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*
e^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) - (b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(e - c*e*x)^(5/2)) + (2*b*e^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*e^2*x^2*(1 - c^2*x^2)^(3/2)*
(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*e^2*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
 (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*
x)^(5/2)) + (c^2*e^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x
)^(5/2)*(e - c*e*x)^(5/2)) + (2*e^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2
)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*e^2*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((4*I)/3)
*b*e^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*e^2*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (((2*I)/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*b^2*e^
2*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.2393, antiderivative size = 896, normalized size of antiderivative = 1., number of steps used = 30, number of rules used = 18, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {4673, 4763, 4655, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 191, 4657, 4181, 261, 4681, 4703, 288, 216}

$$\frac{c^2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2x^3}{3(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{bce^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)x^2}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2\left(1-c^2x^2\right)^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2e^2\left(1-c^2x^2\right)^2}{3(cxd+d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```


```
[Out] (-2*b^2*e^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2
*b^2*e^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*
e^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) - (b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(e - c*e*x)^(5/2)) + (2*b*e^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*e^2*x^2*(1 - c^2*x^2)^(3/2)*
(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*e^2*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
 (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*
x)^(5/2)) + (c^2*e^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x
)^(5/2)*(e - c*e*x)^(5/2)) + (2*e^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2
)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*e^2*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((4*I)/3)
```

```
*b*e^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*e^2*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (((2*I)/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*b^2*e^
2*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(e-cex)^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{e^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}} - \frac{2ce^2x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}} + \frac{c^2e^2x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2ce^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(c^2e^2\left(1-\right.\right.}{(d}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3\left(1-c^2x^2\right)\left(a\right.}{3(d+cdx)^{5/2}(}$$

$$= -\frac{be^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2be^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bce^2x^2\left(1-c^2\right.}{3(d+cd}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2e^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2\left(\right.}{3}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2e^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2\left(\right.}{3}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2e^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2\left(\right.}{3}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2e^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2\left(\right.}{3}$$

Mathematica [A] time = 7.394, size = 536, normalized size = 0.6

$$\frac{b^2\sqrt{1-c^2x^2}\sqrt{cdx+d}\sqrt{e-cex}\left(-8i\text{PolyLog}\left(2,-ie^{-i\sin^{-1}(cx)}\right)+\cot\left(\frac{1}{4}\left(2\sin^{-1}(cx)+\pi\right)\right)\left(2\sin^{-1}(cx)^2+\sin^{-1}(cx)^2\csc^2\right.\right.}{6cd^2\sqrt{-(cdx+d)(e-cex)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-a^2/(3*d^3*e*(1 + c*x)^2) - a^2/
(3*d^3*e*(1 + c*x))))/c + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2
*x^2]*(Cot[(Pi + 2*ArcSin[c*x])/4]*(4 + 2*ArcSin[c*x]^2 + ArcSin[c*x]^2*Csc
[(Pi + 2*ArcSin[c*x])/4]^2) + 2*ArcSin[c*x]*((-I)*ArcSin[c*x] + Csc[(Pi + 2
*ArcSin[c*x])/4]^2 - 4*Log[1 + I/E^(I*ArcSin[c*x])]) - (8*I)*PolyLog[2, (-I
)/E^(I*ArcSin[c*x])]))/(6*c*d^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[-(d*e
*(1 - c^2*x^2))]) + (a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*
(Cos[ArcSin[c*x]/2]*(2 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]]) + 2*(1 - ArcSin[c*x] + Sqrt[1 - c^2*x^2]*(ArcSin
[c*x] - 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 4*Log[Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^2*Sqrt[-((d + c*
d*x)*(e - c*e*x))]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[Arc
```

```
Sin[c*x]/2])^3)
```

Maple [F] time = 0.263, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 (cdx+d)^{-\frac{5}{2}} \frac{1}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^4d^3ex^4+2\,c^3d^3ex^3-2\,cd^3ex-d^3e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^4*d^3*e*x^4 + 2*c^3*d^3*e*x^3 - 2*c*d^3*e*x - d^3*e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(cdx + d)^{\frac{5}{2}} \sqrt{-cex + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)), x)
```

3.564 $\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=918

$$-\frac{5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3d^4}{2bc(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{b^2x\left(1-c^2x^2\right)^2d^4}{4(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8b^2\left(1-c^2x^2\right)^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)^2\left(a+b\sin^{-}\right.}{2(cxd+d)^{3/2}(e-ce}$$

```
[Out] (-8*a*b*d^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(8*b^2*d^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*
d^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*d^4*(
1 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
 (8*b^2*d^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2)) - (b*c*d^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*d^4*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
 (4*d^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) + (d^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^
(3/2)*(e - c*e*x)^(3/2)) - (5*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3
)/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((32*I)*b*d^4*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) + (16*b*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*
I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyL
og[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I
)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 1.27519, antiderivative size = 918, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 19, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.594, Rules used = {4673, 4775, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181, 4641, 4619, 261, 4707, 4627, 321, 216}

$$-\frac{5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3d^4}{2bc(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{b^2x\left(1-c^2x^2\right)^2d^4}{4(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8b^2\left(1-c^2x^2\right)^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)^2\left(a+b\sin^{-}\right.}{2(cxd+d)^{3/2}(e-ce}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```


```
[Out] (-8*a*b*d^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(8*b^2*d^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*
d^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*d^4*(
1 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
 (8*b^2*d^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2)) - (b*c*d^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*d^4*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
 (4*d^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) + (d^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^
```

```
(3/2)*(e - c*e*x)^(3/2)) - (5*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3
)/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((32*I)*b*d^4*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) + (16*b*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*
I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyL
og[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I
)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{8\left(d^4+cd^4x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{7d^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \frac{4cd^4x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(8\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(d^4+cd^4x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(7d^4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right.}{\sqrt{1-c^2x^2}}}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{4d^4\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{7d^4(1}{3}$$

$$= -\frac{8abd^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{2(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4\left(1-c^2\right.}{c(d+}$$

$$= -\frac{8abd^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4x\left(1-c^2x^2\right)^{3/2}\sin}{(d+cdx)^{3/2}(e-cex)^{3}}$$

$$= -\frac{8abd^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x\left(1-c^2x^2\right)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [B] time = 13.589, size = 2029, normalized size = 2.21

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((4*a^2*d^2)/e^2 + (a^2*c*d^2*x)/(
2*e^2) - (8*a^2*d^2)/(e^2*(-1 + c*x))))/c + (15*a^2*d^(5/2)*ArcTan[(c*x*Sqr
t[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x)
)])/(2*c*e^(3/2)) - (a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt
[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x]
- 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSi
n[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2
]))/(c*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) +
 (4*a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x
^2))]*(Cos[ArcSin[c*x]/2]*(-(c*x) + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSi
n[c*x] - ArcSin[c*x]^2 + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) +
```

```
(c*x + 2*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 4*Lo
g[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqr
t[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[A
rcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) - (b^2*d^2*(1 +
 c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-18*I)*P
i*ArcSin[c*x] - (6 - 6*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^(
(-I)*ArcSin[c*x])] + 12*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] +
 24*Pi*Log[Cos[ArcSin[c*x]/2]] - 12*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] +
(24*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (12*ArcSin[c*x]^2*Sin[ArcSin[c*
x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])))/(3*c*e^2*Sqrt[-((d + c*d
*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
])^2) - (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 -
c^2*x^2))]*((96*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - ((48 - 48*I)*ArcSin[c*
x]^2)/Sqrt[1 - c^2*x^2] + (20*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] - 48*(-2 + A
rcSin[c*x]^2) - 6*c*x*(-1 + 2*ArcSin[c*x]^2) - (6*ArcSin[c*x]*Cos[2*ArcSin[
c*x]])/Sqrt[1 - c^2*x^2] + (48*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I
)*ArcSin[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*P
i*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (96*ArcSin[c*x]^2*
Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2]))))/(24*c*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2])^2) - (2*b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*Sqrt[-(d*e*(1 - c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - 3
*ArcSin[c*x]^2 - ((6 - 6*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (2*ArcSin[c*
x]^3)/Sqrt[1 - c^2*x^2] + (6*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*
ArcSin[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*
Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*Po
lyLog[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (12*ArcSin[c*x]^2*Si
n[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]))))/(3*c*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2])^2) + (a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqr
t[-(d*e*(1 - c^2*x^2))]*((-15 + 14*ArcSin[c*x])*Cos[(3*ArcSin[c*x])/2] + Co
s[(5*ArcSin[c*x])/2] + 2*ArcSin[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*
x]/2]*(16 + 48*ArcSin[c*x] - 20*ArcSin[c*x]^2 + 64*Log[Cos[ArcSin[c*x]/2] -
 Sin[ArcSin[c*x]/2]]) - 16*Sin[ArcSin[c*x]/2] + 48*ArcSin[c*x]*Sin[ArcSin[c
*x]/2] + 20*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] - 64*Log[Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2]]*Sin[ArcSin[c*x]/2] - 15*Sin[(3*ArcSin[c*x])/2] - 14*Arc
Sin[c*x]*Sin[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2] + 2*ArcSin[c*x]*Si
n[(5*ArcSin[c*x])/2]))/(8*c*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c
^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2])^2)
```

Maple [F] time = 0.207, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (cdx + d)^{\frac{5}{2}} (-cex + e)^{-\frac{3}{2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2c^2d^2x^2+2\,a^2cd^2x+a^2d^2+\left(b^2c^2d^2x^2+2\,b^2cd^2x+b^2d^2\right)\arcsin\left(cx\right)^2+2\left(abc^2d^2x^2+2\,abcd^2x+abd^2\right)\right.}{c^2e^2x^2-2\,ce^2x+e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2*
b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x +
 a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*e^2*x^2 - 2*c*
e^2*x + e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

3.565 $\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=713

$$-\frac{8ib^2d^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{8ib^2d^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2d^3\left(1-c^2x^2\right)^{3/2}\text{Poly}}{c(cdx+d)^{3/2}(}$$

```
[Out] (-2*a*b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(2*b^2*d^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (2*b^
2*d^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) + (4*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) + (4*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a +
b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^3*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
+ ((16*I)*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[
c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E
^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b^2*d^3
*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) - ((4*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 1.04947, antiderivative size = 713, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.469, Rules used = {4673, 4775, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181, 4641, 4619, 261}

$$-\frac{8ib^2d^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{8ib^2d^3\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2d^3\left(1-c^2x^2\right)^{3/2}\text{Poly}}{c(cdx+d)^{3/2}(}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```


```
[Out] (-2*a*b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(2*b^2*d^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (2*b^
2*d^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) + (4*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) + (4*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a +
b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^3*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
+ ((16*I)*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[
c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E
^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b^2*d^3
*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) - ((4*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{4\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{3d^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \frac{cd^3x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\right) d\cdots}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(3d^3\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\cdots\right.}{\sqrt{1-c^2x^2}}\cdots}{(d+cdx)^{3/2}(e-cex)^{3/2}}\cdots$$

$$= \frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \cdots$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3\left(1-c^2x^2\right)^{3/2}\cdots}{bc(d+cdx)\cdots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3\left(1-c^2x^2\right)\left(a+\cdots\right.}{c(d+cdx)^{3/2}\cdots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x\left(1-c^2x^2\right)^{3/2}\sin^{-}\cdots}{(d+cdx)^{3/2}(e-cex)^{3}\cdots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x\left(1-c^2x^2\right)^{3/2}\sin^{-}\cdots}{(d+cdx)^{3/2}(e-cex)^{3}\cdots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x\left(1-c^2x^2\right)^{3/2}\sin^{-}\cdots}{(d+cdx)^{3/2}(e-cex)^{3}\cdots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x\left(1-c^2x^2\right)^{3/2}\sin^{-}\cdots}{(d+cdx)^{3/2}(e-cex)^{3}\cdots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x\left(1-c^2x^2\right)^{3/2}\sin^{-}\cdots}{(d+cdx)^{3/2}(e-cex)^{3}\cdots}$$

Mathematica [A] time = 10.44, size = 1247, normalized size = 1.75

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((a^2*d)/e^2 - (4*a^2*d)/(e^2*(-1
+ c*x))))/c + (3*a^2*d^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 +
c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*e^(3/2)) - (a*b*d*(1 + c
*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[
c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2]
- Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[-((d + c*d*x)*(e -
c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[A
rcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*a*b*d*(1 + c*x)*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-(c*x) + 2
*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]^2 + 4*Log[Cos[Ar
cSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + (c*x + 2*ArcSin[c*x] - Sqrt[1 - c^2*x
```

```
^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1
- c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] +
Sin[ArcSin[c*x]/2])^2) - (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*S
qrt[-(d*e*(1 - c^2*x^2))]*((-18*I)*Pi*ArcSin[c*x] - (6 - 6*I)*ArcSin[c*x]^2
 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 12*(Pi - 2*ArcSin[
c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 24*Pi*Log[Cos[ArcSin[c*x]/2]] - 12*Pi*
Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)] - (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin
[c*x]/2])))/(3*c*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) - (b^2*d*(1 + c*x)*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[
1 - c^2*x^2] - 3*ArcSin[c*x]^2 - ((6 - 6*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2
] + (2*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + (6*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*
Log[1 + E^((-I)*ArcSin[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSi
n[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x]
)/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (12*
ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2]))))/(3*c*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2])^2)
```

Maple [F] time = 0.202, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (cdx + d)^{\frac{3}{2}} (-cex + e)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2cdx + a^2d + \left(b^2cdx + b^2d\right)\arcsin (cx)^2 + 2\,(abcdx + abd)\arcsin (cx)\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^2e^2x^2 - 2\,ce^2x + e^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c*
d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*e^2*x^2 - 2
*c*e^2*x + e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

3.566 $\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=530

$$-\frac{4ib^2d^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4ib^2d^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2d^2\left(1-c^2x^2\right)^{3/2}\text{Poly}}{c(cdx+d)^{3/2}(}$$

```
[Out] (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x
)^(3/2)) + (2*d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) - ((2*I)*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*
ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b*d^2*
(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) - ((4*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b^2*d^2*(1 - c^2*x^2)^(
3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - ((2*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 0.908954, antiderivative size = 530, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4673, 4775, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181, 4641}

$$-\frac{4ib^2d^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4ib^2d^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2d^2\left(1-c^2x^2\right)^{3/2}\text{Poly}}{c(cdx+d)^{3/2}(}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```


```
[Out] (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x
)^(3/2)) + (2*d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) - ((2*I)*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*
ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b*d^2*
(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) - ((4*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b^2*d^2*(1 - c^2*x^2)^(
3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - ((2*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
```

```
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{2\left(d^2+cd^2x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{d^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(d^2+cd^2x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(d^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,d}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \left(\frac{d^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} + \frac{cd^2x(}{(}\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{d^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2d^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{(2}{}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^2\left(1-c\right.}{3bc(}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^2\left(1-c\right.}{3bc(}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2id^2\left(1-\right.}{c(}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2id^2\left(1-\right.}{c(}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2id^2\left(1-\right.}{c(}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2id^2\left(1-\right.}{c(}$$

Mathematica [A] time = 5.92626, size = 513, normalized size = 0.97

$$-\frac{\frac{b^2(cx+1)\sqrt{cdx+d}\sqrt{e-cex}\left(24i\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)^3-(6-6i)\sin^{-1}(cx)^2-18i\pi\sin^{-1}(cx)-24\pi\log\left(1+e^{-i\sin^{-1}(cx)}\right)+12\left(\pi-2\sin^{-1}(cx)\right)\log\left(1+\right.\right.}{\sqrt{1-c^2x^2}\left(\sin\left(\frac{1}{2}\sin^{-1}(cx)\right)+\cos\left(\frac{1}{2}\sin^{-1}(cx)\right.\right.}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] -((6*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(-1 + c*x) - 3*a^2*Sqrt[d]*Sqrt[e
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x
^2))] + (3*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2
]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c
*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[
ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2
*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-18*I)*Pi*ArcSin[c*x] - (6 - 6
```

```
*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 1
2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 24*Pi*Log[Cos[ArcSin[
c*x]/2]] - 12*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*I)*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])] - (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])^2))/(3*c*e^2)
```

Maple [F] time = 0.217, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 \sqrt{cdx+d}\,(-cex+e)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^2e^2x^2-2\,ce^2x+e^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^2*e^2*x^2 - 2*c*e^2*x + e^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{d(cx+1)}\,(a+b\,\mathrm{asin}(cx))^2}{(-e(cx-1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))**2/(-e*(c*x - 1))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cdx+d}(b\arcsin{(cx)}+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

3.567 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=454

$$-\frac{2ib^2d\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2ib^2d\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2d\left(1-c^2x^2\right)^{3/2}\text{PolyLog}}{c(cdx+d)^{3/2}(e-}$$

```
[Out] (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) - (I*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c
*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((2*I)*b^2*d*(1 - c^2*x^2)^(3/
2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) + ((2*I)*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog
[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rubi [A] time = 0.659388, antiderivative size = 454, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {4673, 4763, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 4657, 4181}

$$-\frac{2ib^2d\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2ib^2d\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2d\left(1-c^2x^2\right)^{3/2}\text{PolyLog}}{c(cdx+d)^{3/2}(e-}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```


```
[Out] (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) - (I*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c
*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((2*I)*b^2*d*(1 - c^2*x^2)^(3/
2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) + ((2*I)*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog
[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
```

```
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{d\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}+\frac{cdx\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(d\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(cd\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2bd\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a+}{}}{(d+cdx)^{3/2}(e-c}$$

$$= \frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2bd\left(1-c^2x^2\right)^{3/2}\right)\text{Sub}}{c(d+}$$

$$= \frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{id\left(1-c^2x^2\right)^{3/2}\left(a+b\text{si}\right.}{c(d+cdx)^{3/2}(e-ce}$$

$$= \frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{id\left(1-c^2x^2\right)^{3/2}\left(a+b\text{si}\right.}{c(d+cdx)^{3/2}(e-ce}$$

$$= \frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{id\left(1-c^2x^2\right)^{3/2}\left(a+b\text{si}\right.}{c(d+cdx)^{3/2}(e-ce}$$

$$= \frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{id\left(1-c^2x^2\right)^{3/2}\left(a+b\text{si}\right.}{c(d+cdx)^{3/2}(e-ce}$$

Mathematica [A] time = 1.68872, size = 221, normalized size = 0.49

$$-\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(-4ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+2b\sqrt{1-c^2x^2}\sin^{-1}(cx)\left(a\tan\left(\frac{1}{4}\left(2\sin^{-1}(cx)+\pi\right)\right)+2b\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a*(a + a*c*x + 4*b*Sqrt[1 - c^2*x^2]*Lo
g[Cos[(Pi + 2*ArcSin[c*x])/4]]) - (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])] + b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*(-I + Tan[(Pi +
 2*ArcSin[c*x])/4]) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(2*b*Log[1 + I*E^(I
*ArcSin[c*x])] + a*Tan[(Pi + 2*ArcSin[c*x])/4])))/(c*d*e^2*(-1 + c*x)*(1 +
c*x)))
```

Maple [F] time = 0.26, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 \frac{1}{\sqrt{cdx+d}} (-cex+e)^{-\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^3de^2x^3-c^2de^2x^2-cde^2x+de^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^3*d*e^2*x^3 - c^2*d*e^2*x^2 - c*d*e^2*x + d*e^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\operatorname{asin}(cx))^2}{\sqrt{d(cx+1)}\,(-e(cx-1))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)), x)
```

3.568 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=217

$$-\frac{ib^2\left(1-c^2x^2\right)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b}{}$$

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Rubi [A] time = 0.377234, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.219, Rules used = {4673, 4651, 4675, 3719, 2190, 2279, 2391}

$$-\frac{ib^2\left(1-c^2x^2\right)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```


```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bc\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b\left(1-c^2x^2\right)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(c\right.}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4ib\left(1-c^2x^2\right)^{3/2}\right)\text{Su}}{c(d+}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b\left(1-c^2x^2\right)^{3/2}(a+}{c(d+}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b\left(1-c^2x^2\right)^{3/2}(a+}{c(d+}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b\left(1-c^2x^2\right)^{3/2}(a+}{c(d+}$$

Mathematica [B] time = 1.33553, size = 550, normalized size = 2.53

$$-2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+a^2cx+2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\sin^{-1}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a^2*c*x + 2*a*b*c*x*ArcSin[c*x] + (2*I)*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + b^2*c*x*ArcSin[c*x]^2 - I*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 4*b^2*
Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^
2]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*
x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 4
*b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2
]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d*e*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F] time = 0.253, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (cdx + d)^{-\frac{3}{2}} (-cex + e)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2 \arcsin (cx)^2 + 2\, ab \arcsin (cx) + a^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^4 d^2 e^2 x^4 - 2\, c^2 d^2 e^2 x^2 + d^2 e^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(cdx + d)^{\frac{3}{2}}(-cex + e)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x)
```

3.569 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=709

$$\frac{ib^2e\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{ib^2e\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2e\left(1-c^2x^2\right)^{5/2}\text{PolyLog}}{3c(cdx+d)^{5/2}(e-}$$

```
[Out] -(b^2*e*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2*e
*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*e*(1 - c^2
*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
+ (b*e*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) - (e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2)) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*e*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*e*(1 - c^2*x^2)^
(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2
*I)/3)*b*e*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])
])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*e*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e
- c*e*x)^(5/2)) + ((I/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e*(1 - c^2
*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*
x)^(5/2)) - (((2*I)/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSi
n[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 0.839333, antiderivative size = 709, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 14, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {4673, 4763, 4655, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 191, 4657, 4181, 261}

$$\frac{ib^2e\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{ib^2e\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2e\left(1-c^2x^2\right)^{5/2}\text{PolyLog}}{3c(cdx+d)^{5/2}(e-}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```


```
[Out] -(b^2*e*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2*e
*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*e*(1 - c^2
*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
+ (b*e*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) - (e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2)) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*e*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*e*(1 - c^2*x^2)^
(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2
*I)/3)*b*e*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])
])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*e*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e
- c*e*x)^(5/2)) + ((I/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e*(1 - c^2
*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*
x)^(5/2)) - (((2*I)/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSi
n[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(e-cex)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{e\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}} - \frac{cex\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(ce\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2e\left(1-c^2x^2\right)^{5/2}\right)\int \cdots}{3(d+cdx)^{5/2}(\cdots}$$

$$= -\frac{be\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{bex\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e\left(1-c^2x^2\right)\left(a \cdots\right.}{3c(d+cdx)^{5/\cdots}}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [A] time = 8.23342, size = 735, normalized size = 1.04

$$\frac{b^2\sqrt{1-c^2x^2}\sqrt{cdx+d}\sqrt{e-cex}\left(6i\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+10i\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+(1+4i)\sin^{-1}(cx)^2-7i\pi\sin^{-\cdots}\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-a^2/(4*d^3*e^2*(-1 + c*x)) - a^2
/(6*d^3*e^2*(1 + c*x)^2) - (5*a^2)/(12*d^3*e^2*(1 + c*x))))/c + (a*b*Sqrt[d
 + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]*(-2*c*x + Cos[2*ArcSin[c*x]]) - Sq
rt[1 - c^2*x^2]*(-1 + 3*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 5*Lo
g[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + c*x*(3*Log[Cos[ArcSin[c*x]/2]
- Sin[ArcSin[c*x]/2]] + 5*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]))))/
(3*c*d^2*e*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*Sqrt[1 - c^2*x^2]*((-7*I)*Pi*ArcSin[c*x] + (1 + 4*I)*ArcSin[c*x]^2 - 1
6*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 5*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*
ArcSin[c*x])] + 3*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 16*Pi
```

```
*Log[Cos[ArcSin[c*x]/2]] - 3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 5*Pi*Lo
g[Sin[(Pi + 2*ArcSin[c*x])/4]] + (6*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
 (10*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] - (3*ArcSin[c*x]^2*Sin[ArcSin[c*x]/
2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (2*ArcSin[c*x]^2*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (ArcSin[c*x]*(2 + A
rcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - ((4 + 5*ArcSin[c
*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(6*c
*d^2*e*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[-(d*e*(1 - c^2*x^2))])
```

Maple [F] time = 0.257, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (cdx + d)^{-\frac{5}{2}} (-cex + e)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2 \arcsin (cx)^2 + 2\,ab \arcsin (cx) + a^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^5d^3e^2x^5 + c^4d^3e^2x^4 - 2\,c^3d^3e^2x^3 - 2\,c^2d^3e^2x^2 + cd^3e^2x + d^3e^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^5*d^3*e^2*x^5 + c^4*d^3*e^2*x^4 - 2*c^3*d^3*e^2*x^3 - 2*c^2
*d^3*e^2*x^2 + c*d^3*e^2*x + d^3*e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(cdx + d)^{\frac{5}{2}}(-cex + e)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)), x)
```

3.570 $\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=730

$$-\frac{112ib^2d^5\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{-i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{5d^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{d^5}{}$$

```
[Out] (2*a*b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (
2*b^2*d^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b^2
*d^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (((28*I)/3)*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/
(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*d^5*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*d^5*(
1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(
d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((112*I)/3)*b^2*d^5*(1 - c^2*x^2)^(5
/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (8*b*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]
/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (16*b^2*d^5*(1 - c^2*x^2
)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (28*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x
]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*d^5*(1 - c^2*x^2)^(5/2
)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.29148, antiderivative size = 730, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 16, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4673, 4775, 4641, 4677, 4619, 261, 4773, 3318, 4186, 3767, 8, 4184, 3717, 2190, 2279, 2391}

$$-\frac{112ib^2d^5\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{-i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{5d^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{d^5}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```


```
[Out] (2*a*b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (
2*b^2*d^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b^2
*d^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (((28*I)/3)*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/
(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*d^5*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*d^5*(
1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(
d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((112*I)/3)*b^2*d^5*(1 - c^2*x^2)^(5
/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (8*b*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]
/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (16*b^2*d^5*(1 - c^2*x^2
)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (28*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x
]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*d^5*(1 - c^2*x^2)^(5/2
)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3318

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1*(e + (Pi*a)/(2*b)))/2 +
 (f*x)/2]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 4186

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> -Simp[(b^2*(c + d*x)^m*Cot[e + f*x]*(b*Csc[e + f*x])^(n - 2))/(f*(n -
 1)), x] + (Dist[(b^2*d^2*m*(m - 1))/(f^2*(n - 1)*(n - 2)), Int[(c + d*x)^(
m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[(b^2*(n - 2))/(n - 1), Int[(
c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[(b^2*d*m*(c + d*x)^(m -
1)*(b*Csc[e + f*x])^(n - 2))/(f^2*(n - 1)*(n - 2)), x]) /; FreeQ[{b, c, d,
e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4184

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> -Sim
p[((c + d*x)^m*Cot[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Co
t[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^5\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int\left(\frac{5d^5\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}+\frac{cd^5x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}+\frac{8d^5\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)^2\sqrt{1-c^2x^2}}+\frac{12d^5\left(a+b\sin\right.}{(-1+cx)\sqrt{}}\right.}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(5d^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(8d^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)^2\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

$$= -\frac{d^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{5d^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+\left(12d^5\right.$$

$$= \frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{d^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{5d^5\left(1-c^2x^2\right)^{5/2}(a+}{3bc(d+cdx)^{5/2}(}$$

$$= \frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{d^5\left(1-c^2x^2\right)^3\left(a+b\sin\right.}{c(d+cdx)^{5/2}(e-ce}$$

$$= \frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5\left(1-c^2x^2\right)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5x\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [B] time = 12.8956, size = 2300, normalized size = 3.15

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-((a^2*d^2)/e^3) + (8*a^2*d^2)/(3
*e^3*(-1 + c*x)^2) + (28*a^2*d^2)/(3*e^3*(-1 + c*x))))/c - (5*a^2*d^(5/2)*A
rcTan[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 +
c*x)*(1 + c*x))]])/(c*e^(5/2)) + (a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sq
rt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*
x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x]
 + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] + 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*
Sin[ArcSin[c*x]/2]))/(3*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[
c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
+ (a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[
ArcSin[c*x]/2]*(-8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 +
```

```
3*ArcSin[c*x])) + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 +
 4*ArcSin[c*x] - 6*ArcSin[c*x]^2 + 56*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c
*x]/2]] + Sqrt[1 - c^2*x^2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[
ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]))*Sin[ArcSin[c*x]/2]))/(3*c*e^3*Sqrt[-
((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-3*I)*Pi*ArcSin[c*x] + (4*Arc
Sin[c*x])/(-1 + c*x) - (1 - I)*ArcSin[c*x]^2 - (2*ArcSin[c*x]^2)/(-1 + c*x)
 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] -
 4*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]]
- 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSi
n[c*x])] + (2*(4 + ArcSin[c*x]^2 + c*x*(-4 + ArcSin[c*x]^2))*Sin[ArcSin[c*x
]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3))/(3*c*e^3*Sqrt[-((d + c*
d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2])^2) + (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 -
 c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*(-2 + ArcSin[c*
x])*ArcSin[c*x])/((-1 + c*x)*Sqrt[1 - c^2*x^2]) - 3*ArcSin[c*x]^2 - ((13 -
13*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (3*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2
] + (13*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*(Pi
 - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2
]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*Ar
cSin[c*x])]))/Sqrt[1 - c^2*x^2] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqr
t[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3) + (2*(4 - 13*Ar
cSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - S
in[ArcSin[c*x]/2]))))/(3*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-21*I)*Pi*ArcSin[c*x] - (2*(-2 +
 ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) - (7 - 7*I)*ArcSin[c*x]^2 + ArcSin[c*
x]^3 - 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi - 2*ArcSin[c*x])*Log[1
+ I*E^(I*ArcSin[c*x])] + 28*Pi*Log[Cos[ArcSin[c*x]/2]] - 14*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] + (28*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*ArcS
in[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 +
 (2*(4 - 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2])))/(3*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*
(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (a*b*d^2*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(3*Cos[(5*ArcSin[c*x])/2] + 3*ArcSi
n[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(-20 - 24*ArcSin[c*x] +
27*ArcSin[c*x]^2 - 156*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[
(3*ArcSin[c*x])/2]*(9 - 35*ArcSin[c*x] - 9*ArcSin[c*x]^2 + 52*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 20*Sin[ArcSin[c*x]/2] - 24*ArcSin[c*x]*S
in[ArcSin[c*x]/2] - 27*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] + 156*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[ArcSin[c*x]/2] + 9*Sin[(3*ArcSin[c*x])/
2] + 35*ArcSin[c*x]*Sin[(3*ArcSin[c*x])/2] - 9*ArcSin[c*x]^2*Sin[(3*ArcSin[
c*x])/2] + 52*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[(3*ArcSin[c*
x])/2] - 3*Sin[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Sin[(5*ArcSin[c*x])/2]))/
(6*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[
c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F] time = 0.202, size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (cdx + d)^{\frac{5}{2}} (-cex + e)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2d^2x^2 + 2\,a^2cd^2x + a^2d^2 + \left(b^2c^2d^2x^2 + 2\,b^2cd^2x + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abc^2d^2x^2 + 2\,abcd^2x + abd^2\right)\text{ar}}{c^3e^3x^3 - 3\,c^2e^3x^2 + 3\,ce^3x - e^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x
+ a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*e^3*x^3 - 3*c
^2*e^3*x^2 + 3*c*e^3*x - e^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx + d)^{\frac{5}{2}}(b\arcsin(cx) + a)^2}{(-cex + e)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

3.571 $\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=544

$$-\frac{32ib^2d^4\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{-i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{8id^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(\right.}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[Out] (((-8*I)/3)*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2)) + (d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(
3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (32*b*d^4*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)) - (((32*I)/3)*b^2*d^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(
I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*d^4*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*b^2*d^4*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + Ar
cSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*d^4*(1 - c^2*x
^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^
2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.14456, antiderivative size = 544, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4673, 4775, 4641, 4773, 3318, 4186, 3767, 8, 4184, 3717, 2190, 2279, 2391}

$$-\frac{32ib^2d^4\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{-i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{8id^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(\right.}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (((-8*I)/3)*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2)) + (d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(
3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (32*b*d^4*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)) - (((32*I)/3)*b^2*d^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(
I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*d^4*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*b^2*d^4*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + Ar
cSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*d^4*(1 - c^2*x
^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^
2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3318

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1*(e + (Pi*a)/(2*b)))/2 +
 (f*x)/2]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 4186

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> -Simp[(b^2*(c + d*x)^m*Cot[e + f*x]*(b*Csc[e + f*x])^(n - 2))/(f*(n -
 1)), x] + (Dist[(b^2*d^2*m*(m - 1))/(f^2*(n - 1)*(n - 2)), Int[(c + d*x)^(
m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[(b^2*(n - 2))/(n - 1), Int[(
c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[(b^2*d*m*(c + d*x)^(m -
1)*(b*Csc[e + f*x])^(n - 2))/(f^2*(n - 1)*(n - 2)), x]) /; FreeQ[{b, c, d,
e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4184

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> -Sim
p[((c + d*x)^m*Cot[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Co
t[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
```

```
x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx=\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{\left(1-c^2x^2\right)^{5/2}\int\left(\frac{d^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}+\frac{4d^4\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)^2\sqrt{1-c^2x^2}}+\frac{4d^4\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{\left(d^4\left(1-c^2x^2\right)^{5/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(4d^4\left(1-c^2x^2\right)^{5/2}\right)\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(4d^4\left(1-c^2x^2\right)^{5/2}\right)\text{Subst}\left(\int\frac{(a+bx)^2}{-c+c\sin(x)}\,dx,\right.}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(d^4\left(1-c^2x^2\right)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^4\right.}{c(d+cdx)^{5/2}(e-cex}$$

$$=\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4bd^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\sec^2\left(\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=-\frac{4id^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-$$

$$=-\frac{8id^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

$$=-\frac{8id^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

$$=-\frac{8id^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

$$=-\frac{8id^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}+$$

Mathematica [B] time = 9.92032, size = 1411, normalized size = 2.59

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((4*a^2*d)/(3*e^3*(-1 + c*x)^2) +
(8*a^2*d)/(3*e^3*(-1 + c*x))))/c - (a^2*d^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 +
c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*e^(5/
2)) + (a*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Co
s[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*Sqrt[1 - c^2*x^2]
*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*e^
3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]
)^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (a*b*d*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-8 - 6*ArcSin[
c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) +
 Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*ArcSin[c*x])) + 28*Log[Cos[A
rcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 4*ArcSin[c*x] - 6*ArcSin[c*x]
^2 + 56*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*((
14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]]))*Sin[ArcSin[c*x]/2]))/(6*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2])) + (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 -
 c^2*x^2))]*((-3*I)*Pi*ArcSin[c*x] + (4*ArcSin[c*x])/(-1 + c*x) - (1 - I)*A
rcSin[c*x]^2 - (2*ArcSin[c*x]^2)/(-1 + c*x) - 4*Pi*Log[1 + E^((-I)*ArcSin[c
*x])] + 2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + I*E^(I*Ar
cSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c
*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*(4 + ArcSin[c*x]^2
 + c*x*(-4 + ArcSin[c*x]^2))*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[
ArcSin[c*x]/2])^3))/(3*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*
x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*d*(1 + c*x)*Sqrt[d
 + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-21*I)*Pi*ArcSin[c*x
] - (2*(-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) - (7 - 7*I)*ArcSin[c*x]^2
 + ArcSin[c*x]^3 - 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi - 2*ArcSin[
c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 28*Pi*Log[Cos[ArcSin[c*x]/2]] - 14*Pi*
Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (28*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[
c*x]/2])^3 + (2*(4 - 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/
2] - Sin[ArcSin[c*x]/2])))/(3*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1
 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)
```

Maple [F] time = 0.206, size = 0, normalized size = 0.

$$\int (a + b\arcsin(cx))^2 (cdx + d)^{\frac{3}{2}} (-cex + e)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2cdx + a^2d + \left(b^2cdx + b^2d\right)\arcsin\left(cx\right)^2 + 2\left(abcdx + abd\right)\arcsin\left(cx\right)\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^3e^3x^3 - 3\,c^2e^3x^2 + 3\,ce^3x - e^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c
*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*e^3*x^3 -
3*c^2*e^3*x^2 + 3*c*e^3*x - e^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cdx + d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right) + a\right)^2}{\left(-cex + e\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

3.572 $\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=486

$$-\frac{4ib^2d^3\left(1-c^2x^2\right)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{id^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\log\left(1-ie^{-i\sin^{-1}\cdots}\right.}{3c(cdx+d)^{5/2}(e-\cdots}$$

```
[Out] ((-I/3)*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[
1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((4*
I)/3)*b^2*d^3*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSi
n[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) + (4*b^2*d^3*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
 (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2
*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.06978, antiderivative size = 486, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4673, 4775, 4773, 3318, 4186, 3767, 8, 4184, 3717, 2190, 2279, 2391}

$$-\frac{4ib^2d^3\left(1-c^2x^2\right)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{id^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\log\left(1-ie^{-i\sin^{-1}\cdots}\right.}{3c(cdx+d)^{5/2}(e-\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```


```
[Out] ((-I/3)*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[
1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((4*
I)/3)*b^2*d^3*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSi
n[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) + (4*b^2*d^3*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
 (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2
*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
```

```
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 3318

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1*(e + (Pi*a)/(2*b)))/2 +
 (f*x)/2]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 4186

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> -Simp[(b^2*(c + d*x)^m*Cot[e + f*x]*(b*Csc[e + f*x])^(n - 2))/(f*(n -
 1)), x] + (Dist[(b^2*d^2*m*(m - 1))/(f^2*(n - 1)*(n - 2)), Int[(c + d*x)^(
m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[(b^2*(n - 2))/(n - 1), Int[(
c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[(b^2*d*m*(c + d*x)^(m -
1)*(b*Csc[e + f*x])^(n - 2))/(f^2*(n - 1)*(n - 2)), x]) /; FreeQ[{b, c, d,
e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4184

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> -Sim
p[((c + d*x)^m*Cot[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Co
t[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
```

```
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{2d^3\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)^2\sqrt{1-c^2x^2}}+\frac{d^3\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2d^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^3\left(1-c^2x^2\right)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{-c+c\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2cd^3\left(1-c^2x^2\right)^{5/2}\right)\text{Subst}}{(d+cdx)}$$

$$= -\frac{\left(d^3\left(1-c^2x^2\right)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)dx, x, \sin^{-1}(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(d^3\left(1-c^2x^2\right.\right.}{}$$

$$= -\frac{2bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^3\left(1-c^2x^2\right)^{5/2}\left(a+b\right.}{c(d+}$$

$$= -\frac{id^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\sec^2\left(\frac{\pi}{4}+\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{id^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4}{}$$

$$= -\frac{id^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4}{}$$

$$= -\frac{id^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4}{}$$

$$= -\frac{id^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4}{}$$

Mathematica [A] time = 8.23552, size = 683, normalized size = 1.41

$$\frac{b^2(cx+1)\sqrt{cdx+d}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(4i\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-\frac{2\sin^{-1}(cx)^2}{cx-1}-(1-i)\sin^{-1}(cx)^2+\frac{4\sin^{-1}(cx)}{cx-1}-3i\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((2*a^2)/(3*e^3*(-1 + c*x)^2) + a^
2/(3*e^3*(-1 + c*x))))/c + (a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*
(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[
c*x]/2] - Sin[ArcSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Lo
g[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x] + Sqrt[1
 - c^2*x^2]*ArcSin[c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] +
2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSi
n[c*x]/2]))/(3*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*(Cos[ArcSin[c*x]/2] -
 Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b^2*(1
 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-3*I)*
Pi*ArcSin[c*x] + (4*ArcSin[c*x])/(-1 + c*x) - (1 - I)*ArcSin[c*x]^2 - (2*Ar
cSin[c*x]^2)/(-1 + c*x) - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 +
 I*E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*L
og[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*Pol
yLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*(4 + ArcSin[c*x]^2 + c*x*(-4 + ArcSin[
c*x]^2))*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3))/
(3*c*e^3*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x
]/2] + Sin[ArcSin[c*x]/2])^2)
```

Maple [F] time = 0.273, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2\sqrt{cdx+d}\,(-cex+e)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^3e^3x^3-3\,c^2e^3x^2+3\,ce^3x-e^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^3*e^3*x^3 - 3*c^2*e^3*x^2 + 3*c*e^3*x - e^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cdx + d}(b \arcsin(cx) + a)^2}{(-cex + e)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

3.573 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=896

$$\frac{c^2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2x^3}{3(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)x^2}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2\left(1-c^2x^2\right)^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2d^2\left(1-c^2\right.}{3(cxd}$$

```
[Out] (2*b^2*d^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*
b^2*d^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*d
^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (2*b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(
3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*d^2*x^2*(1 - c^2*x^2)^(3/2)*(
a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
(d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (c^2*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)
/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*d^2*(1 - c^2*x^2)^(5/2)*(
a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*
b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c
*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c
*e*x)^(5/2)) - (((2*I)/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*I)/3)*b^2*d^2
*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - ((I/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 1.23074, antiderivative size = 896, normalized size of antiderivative = 1., number of steps used = 30, number of rules used = 18, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {4673, 4763, 4655, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 191, 4657, 4181, 261, 4681, 4703, 288, 216}

$$\frac{c^2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2x^3}{3(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)x^2}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2\left(1-c^2x^2\right)^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2d^2\left(1-c^2\right.}{3(cxd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

```
[Out] (2*b^2*d^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*
b^2*d^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*d
^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (2*b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(
3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*d^2*x^2*(1 - c^2*x^2)^(3/2)*(
a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
(d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (c^2*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)
/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*d^2*(1 - c^2*x^2)^(5/2)*(
a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*
```

```
b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c
*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c
*e*x)^(5/2)) - (((2*I)/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*I)/3)*b^2*d^2
*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - ((I/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{d^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}+\frac{2cd^2x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}+\frac{c^2d^2x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2cd^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(c^2d^2\right.}{}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3\left(1-c^2x^2\right)}{3(d+cdx)^{5}}$$

$$= -\frac{bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bcd^2x^2\left(1-\right.}{3(d}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2d^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd}{}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2d^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd}{}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2d^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd}{}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2d^2\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd}{}$$

Mathematica [A] time = 6.60171, size = 388, normalized size = 0.43

$$\sqrt{cdx+d}\sqrt{e-cex}\left(\frac{b^2\left(-8i\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+4\tan\left(\frac{1}{4}\left(2\sin^{-1}(cx)+\pi\right)\right)+\sin^{-1}(cx)\left(-2\sec^2\left(\frac{1}{4}\left(2\sin^{-1}(cx)+\pi\right)\right)+8\log\left(1+ie^{i\sin^{-1}(cx)}\right)\right)+\sin^{-1}(\right.}{\sqrt{1-c^2x^2}}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-2*a^2*(-2 + c*x))/(-1 + c*x)^2 + (2*a*b
*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]]) + Cos[ArcSin[c*x]/2]*(-2 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(1 - (-1 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]
- 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*S
in[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2])^3) + (b^2*((-8*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + ArcSin[c*x]*(8
*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Sec[(Pi + 2*ArcSin[c*x])/4]^2) + 4*Tan[(P
i + 2*ArcSin[c*x])/4] + ArcSin[c*x]^2*(-2*I + (2 + Sec[(Pi + 2*ArcSin[c*x])
/4]^2)*Tan[(Pi + 2*ArcSin[c*x])/4])))/Sqrt[1 - c^2*x^2]))/(6*c*d*e^3)
```

Maple [F] time = 0.257, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 \frac{1}{\sqrt{cdx+d}}(-cex+e)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^4de^3x^4-2\,c^3de^3x^3+2\,cde^3x-de^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^4*d*e^3*x^4 - 2*c^3*d*e^3*x^3 + 2*c*d*e^3*x - d*e^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)), x)
```

3.574 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=709

$$-\frac{ib^2d\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ib^2d\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2d\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(\right.}{3c(cdx+d)^{5/2}(e-c}$$

```
[Out] (b^2*d*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2*d*
x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*d*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
 (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d +
c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]
)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*d*(1 - c^2*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*
I)/3)*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])]
)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*d*(1 - c^2*x^2)^(5/2)*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) - ((I/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*ArcS
in[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + ((I/3)*b^2*d*(1 - c^2*
x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (((2*I)/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSin
[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 0.835558, antiderivative size = 709, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 14, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {4673, 4763, 4655, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 191, 4657, 4181, 261}

$$-\frac{ib^2d\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ib^2d\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2d\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(\right.}{3c(cdx+d)^{5/2}(e-c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```



```
[Out] (b^2*d*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2*d*
x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*d*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
 (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d +
c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]
)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*d*(1 - c^2*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*
I)/3)*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])]
)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*d*(1 - c^2*x^2)^(5/2)*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) - ((I/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*ArcS
in[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + ((I/3)*b^2*d*(1 - c^2*
x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (((2*I)/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSin
[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{d\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}+\frac{cdx\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(cd\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{dx\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2d\left(1-c^2x^2\right)^{5/2}\right)}{3(d+cdx)^{5/}}$$

$$= -\frac{bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bdx\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d\left(1-c^2x^2\right)}{3c(d+cd}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [A] time = 8.28958, size = 760, normalized size = 1.07

$$-\frac{b^2\sqrt{1-c^2x^2}\sqrt{cdx+d}\sqrt{e-cex}\left(-10i\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-6i\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+(1-4i)\sin^{-1}(cx)^2-\frac{(\text{si}}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(a^2/(6*d^2*e^3*(-1 + c*x)^2) - (5
*a^2)/(12*d^2*e^3*(-1 + c*x)) - a^2/(4*d^2*e^3*(1 + c*x))))/c - (a*b*Sqrt[d
 + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(2*ArcSin[c*x]*(2*c*x + Cos[2*A
rcSin[c*x]]) + Sqrt[1 - c^2*x^2]*(-1 + 5*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - c*x*(5*Log[Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]]))))/(3*c*d*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[-(d*e*(1
- c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3*(Cos[ArcSin[c*x]/2
] + Sin[ArcSin[c*x]/2])) - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^
2*x^2]*((9*I)*Pi*ArcSin[c*x] - ((-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x)
+ (1 - 4*I)*ArcSin[c*x]^2 + 16*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 3*(Pi + 2
```

```
*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 5*(Pi - 2*ArcSin[c*x])*Log[1 +
 I*E^(I*ArcSin[c*x])] - 16*Pi*Log[Cos[ArcSin[c*x]/2]] + 5*Pi*Log[-Cos[(Pi +
 2*ArcSin[c*x])/4]] - 3*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (10*I)*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])] - (6*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (2*A
rcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^
3 + ((4 + 5*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]) + (3*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] +
Sin[ArcSin[c*x]/2])))/(6*c*d*e^2*Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[-(d*
e*(1 - c^2*x^2))])
```

Maple [F] time = 0.257, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 (cdx+d)^{-\frac{3}{2}} (-cex+e)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^5d^2e^3x^5-c^4d^2e^3x^4-2\,c^3d^2e^3x^3+2\,c^2d^2e^3x^2+cd^2e^3x-d^2e^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^5*d^2*e^3*x^5 - c^4*d^2*e^3*x^4 - 2*c^3*d^2*e^3*x^3 + 2*c^
2*d^2*e^3*x^2 + c*d^2*e^3*x - d^2*e^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(cdx + d)^{\frac{3}{2}}(-cex + e)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)), x)
```

3.575 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=366

$$-\frac{2ib^2\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2i\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{b}{}$$

```
[Out] (b^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) + (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (((2*I)/3)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*(1 - c^2*x^2)^(5/2)*(a + b*
ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*
e*x)^(5/2)) - (((2*I)/3)*b^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSi
n[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rubi [A] time = 0.474141, antiderivative size = 366, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4673, 4655, 4651, 4675, 3719, 2190, 2279, 2391, 4677, 191}

$$-\frac{2ib^2\left(1-c^2x^2\right)^{5/2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2i\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{b}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```


```
[Out] (b^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) + (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (((2*I)/3)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*(1 - c^2*x^2)^(5/2)*(a + b*
ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*
e*x)^(5/2)) - (((2*I)/3)*b^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSi
n[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4655

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> -Simp[(x*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*d*(p + 1)
), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSi
n[c*x])^n, x], x] + Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*(p
 + 1)*(1 - c^2*x^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcS
in[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

```
 && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bc\left(1-c^2x^2\right)^{5/2}\right.}{3(d+cdx)^{5}}$$

$$= -\frac{b\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2x\left(1-c^2x^2\right)^2\left(a+\right.}{3(d+cdx)^{5/2}(e}$$

$$= \frac{b^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [A] time = 9.40846, size = 722, normalized size = 1.97

$$\frac{b^2\left(-16i\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-16i\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+2\sqrt{1-c^2x^2}\left(-3i\sin^{-1}(cx)^2+\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (4*a^2*c*x*(3 - 2*c^2*x^2) + b^2*(c*x + 6*c*x*ArcSin[c*x]^2 + (4*I)*Pi*ArcS
in[c*x]*Cos[3*ArcSin[c*x]] - (2*I)*ArcSin[c*x]^2*Cos[3*ArcSin[c*x]] + 8*Pi*
Cos[3*ArcSin[c*x]]*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Cos[3*ArcSin[c*x]]*
Log[1 - I*E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - I*E
^(I*ArcSin[c*x])] - 2*Pi*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] +
4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] - 8*Pi*Cos[3*
ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Cos[3*ArcSin[c*x]]*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] + 2*Sqrt[1 - c^2*x^2]*((-3*I)*ArcSin[c*x]^2 + ArcSin[
c*x]*(-2 + (6*I)*Pi + 6*Log[1 - I*E^(I*ArcSin[c*x])] + 6*Log[1 + I*E^(I*Arc
Sin[c*x])]) + 3*Pi*(4*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin
[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])] - 4*Log[Cos[ArcSin[c*x]/2]] + Log[-C
os[(Pi + 2*ArcSin[c*x])/4]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])) - 2*Pi*Cos
[3*ArcSin[c*x]]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (16*I)*(1 - c^2*x^2)^(3/
2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (16*I)*(1 - c^2*x^2)^(3/2)*PolyLog[
2, I*E^(I*ArcSin[c*x])] + Sin[3*ArcSin[c*x]] + 2*ArcSin[c*x]^2*Sin[3*ArcSin
[c*x]]) + 4*a*b*(Sqrt[1 - c^2*x^2]*(-1 + 2*Log[Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2]] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 2*Cos[2*Arc
Sin[c*x]]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]])) + ArcSin[c*x]*(3*c*x + Sin[3*ArcSin[c*x]])))/
(12*d^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c - c^3*x^2))
```

Maple [F] time = 0.259, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2 (cdx+d)^{-\frac{5}{2}} (-cex+e)^{-\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2 + 2\,ab\arcsin(cx) + a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^6d^3e^3x^6 - 3\,c^4d^3e^3x^4 + 3\,c^2d^3e^3x^2 - d^3e^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^6*d^3*e^3*x^6 - 3*c^4*d^3*e^3*x^4 + 3*c^2*d^3*e^3*x^2 - d^
3*e^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2}{(cdx + d)^{\frac{5}{2}}(-cex + e)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)), x)
```

3.576 $\int x^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=351

$$-\frac{bcx^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{bx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}}+\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}\right.}{24bc^3\sqrt{1-c^2x^2}}$$

```
[Out] (b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(64*c^2) - (b^2*x^3*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/32 - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(6
4*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*Ar
cSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^2)/4 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcS
in[c*x])^3)/(24*b*c^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.70498, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4739, 4697, 4707, 4641, 4627, 321, 216}

$$-\frac{bcx^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}+\frac{bx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}}+\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}\right.}{24bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(64*c^2) - (b^2*x^3*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/32 - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(6
4*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*Ar
cSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^2)/4 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcS
in[c*x])^3)/(24*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{1}{4}x^3\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2(a+b\,\mathrm{s}}{\sqrt{1-}}}{4\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx^4\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}-\frac{x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\,\mathrm{si}\right.}{8c^2}$$

$$=-\frac{1}{32}b^2x^3\sqrt{d+cdx}\sqrt{e-cex}+\frac{bx^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}}-\ldots$$

$$=\frac{b^2x\sqrt{d+cdx}\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d+cdx}\sqrt{e-cex}+\frac{bx^2\sqrt{d+cdx}\sqrt{e-c}}{8c\sqrt{1-}}$$

$$=\frac{b^2x\sqrt{d+cdx}\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d+cdx}\sqrt{e-cex}-\frac{b^2\sqrt{d+cdx}\sqrt{e-ce}}{64c^3\sqrt{1-c^2}}$$

Mathematica [A] time = 1.13902, size = 297, normalized size = 0.85

$$3\sqrt{cdx+d}\sqrt{e-cex}\left(32a^2cx\sqrt{1-c^2x^2}\left(2c^2x^2-1\right)-4ab\cos\left(4\sin^{-1}(cx)\right)+b^2\sin\left(4\sin^{-1}(cx)\right)\right)-96a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*Sqrt[d]*Sqrt
[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]
*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
]*(b*Cos[4*ArcSin[c*x]] + 4*a*Sin[4*ArcSin[c*x]]) - 24*b*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*ArcSin[c*x]^2*(-4*a + b*Sin[4*ArcSin[c*x]]) + 3*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(32*a^2*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^2) - 4*a*b*C
os[4*ArcSin[c*x]] + b^2*Sin[4*ArcSin[c*x]]))/(768*c^3*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.648, size = 0, normalized size = 0.

$$\int x^2\sqrt{cdx+d}\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b^2x^2\arcsin(cx)^2+2\,abx^2\arcsin(cx)+a^2x^2\right)\sqrt{cdx+d}\sqrt{-cex+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*d
*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2*x^2, x)
```

3.577 $\int x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=225

$$-\frac{2bcx^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{e-cex}\,(}{3c^2}$$

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c^2) + (2*b^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(1 - c^2*x^2))/(27*c^2) + (2*b*x*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c^2)
```

Rubi [A] time = 0.394956, antiderivative size = 225, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {4739, 4677, 4645, 444, 43}

$$-\frac{2bcx^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{9\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{e-cex}\,(}{3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c^2) + (2*b^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(1 - c^2*x^2))/(27*c^2) + (2*b*x*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c^2)
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3c^2} + \frac{\left(2b\sqrt{d+cdx}\sqrt{e-cex}\right)}{}$$

$$= \frac{2bx\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\,\mathrm{s}\right.}{9\sqrt{1-c^2x^2}}$$

$$= \frac{2bx\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\,\mathrm{s}\right.}{9\sqrt{1-c^2x^2}}$$

$$= \frac{2bx\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\,\mathrm{s}\right.}{9\sqrt{1-c^2x^2}}$$

$$= \frac{4b^2\sqrt{d+cdx}\sqrt{e-cex}}{9c^2} + \frac{2b^2\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)}{27c^2} + \frac{2bx\sqrt{d+cdx}}{}$$

Mathematica [A] time = 0.58508, size = 178, normalized size = 0.79

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(9a^2\left(c^2x^2-1\right)^2+6abcx\sqrt{1-c^2x^2}\left(c^2x^2-3\right)+6b\sin^{-1}(cx)\left(3a\left(c^2x^2-1\right)^2+bcx\sqrt{1-c^2x^2}\left(c^2x^2-3\right)\right.\right.}{27c^2\left(c^2x^2-1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(6*a*b*c*x*Sqrt[1 - c^2*x^2]*(-3 + c^2*x^2
) + 9*a^2*(-1 + c^2*x^2)^2 - 2*b^2*(7 - 8*c^2*x^2 + c^4*x^4) + 6*b*(b*c*x*S
qrt[1 - c^2*x^2]*(-3 + c^2*x^2) + 3*a*(-1 + c^2*x^2)^2)*ArcSin[c*x] + 9*b^2
*(-1 + c^2*x^2)^2*ArcSin[c*x]^2))/(27*c^2*(-1 + c^2*x^2))
```

Maple [F] time = 0.361, size = 0, normalized size = 0.

$$\int x\sqrt{cdx+d}\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.44801, size = 435, normalized size = 1.93

$$\frac{\left(\left(9\,a^2-2\,b^2\right)c^4x^4-2\left(9\,a^2-8\,b^2\right)c^2x^2+9\left(b^2c^4x^4-2\,b^2c^2x^2+b^2\right)\arcsin\left(cx\right)^2+9\,a^2-14\,b^2+18\left(abc^4x^4-2\,abc^2x^2\right.\right.}{27\left(c^4x^2-c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="fricas")
```

```
[Out] 1/27*((9*a^2 - 2*b^2)*c^4*x^4 - 2*(9*a^2 - 8*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4
- 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + 9*a^2 - 14*b^2 + 18*(a*b*c^4*x^4 - 2
*a*b*c^2*x^2 + a*b)*arcsin(c*x) + 6*(a*b*c^3*x^3 - 3*a*b*c*x + (b^2*c^3*x^3
 - 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))*sqrt(c*d*x + d)*sqrt(-c*e*x
+ e)/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.59997, size = 610, normalized size = 2.71

$$-\frac{\frac{9\,(cdx+d)^{\frac{3}{2}}\sqrt{-(cdx+d)de+2\,d^2e}a^2\left(\frac{(cdx+d)e^{(-6)}}{d^6}-\frac{2\,e^{(-6)}}{d^5}\right)|d|}{cd^3}+\frac{6\left(3\,(cdx+d)^{\frac{3}{2}}\sqrt{-(cdx+d)de+2\,d^2e}\left(\frac{(cdx+d)e^{(-6)}}{d^6}-\frac{2\,e^{(-6)}}{d^5}\right)\arcsin(cx)-\frac{\left((cdx+d)^3-3\,(cdx+d)^2d\right)e^{\left(-\frac{11}{2}\right)}}{d^{\frac{9}{2}}|d|}\right)\cdots}{cd^3}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="giac")
```

```
[Out] -1/4320*(9*(c*d*x + d)^(3/2)*sqrt(-(c*d*x + d)*d*e + 2*d^2*e)*a^2*((c*d*x +
 d)*e^(-6)/d^6 - 2*e^(-6)/d^5)*abs(d)/(c*d^3) + 6*(3*(c*d*x + d)^(3/2)*sqrt
(-(c*d*x + d)*d*e + 2*d^2*e)*((c*d*x + d)*e^(-6)/d^6 - 2*e^(-6)/d^5)*arcsin
(c*x) - ((c*d*x + d)^3 - 3*(c*d*x + d)^2*d)*e^(-11/2)/(d^(9/2)*abs(d)))*a*b
*abs(d)/(c*d^3) + (9*(c*d*x + d)^(3/2)*sqrt(-(c*d*x + d)*d*e + 2*d^2*e)*((c
*d*x + d)*e^(-6)/d^6 - 2*e^(-6)/d^5)*arcsin(c*x)^2 + sqrt(d)*(6*pi*e^(-6)/d
^2 - (6*(c^2*x^2 - 1)*c*d^2*x*arcsin(-c*x) + 24*c*d^2*x*arcsin(-c*x) - 9*sq
rt(-c^2*x^2 + 1)*c*d^2*x + 18*(c^2*x^2 - 1)*d^2*arcsin(-c*x) + 2*(-c^2*x^2
+ 1)^(3/2)*d^2 + 9*d^2*arcsin(-c*x) - 24*sqrt(-c^2*x^2 + 1)*d^2 - 9*(4*c*d*
x*arcsin(-c*x) - sqrt(-c^2*x^2 + 1)*c*d*x + 2*(c^2*x^2 - 1)*d*arcsin(-c*x)
+ d*arcsin(-c*x) - 4*sqrt(-c^2*x^2 + 1)*d)*d)*e^(-6)/d^4)*e^(1/2)/abs(d))*b
^2*abs(d)/(c*d^3))/(c*d)
```

3.578 $\int \sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=222

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(c\right.$$

```
[Out] -(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 + (b^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 0.290495, antiderivative size = 222, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4673, 4647, 4641, 4627, 321, 216}

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^3}{6bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(c\right.$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] -(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 + (b^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{\left(a+b\sin^{-1}(c\right.}{\sqrt{1-c^2x^2}}}{2\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin\right.$$

$$=-\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex}-\frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{}$$

$$=-\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex}+\frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{4c\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d+cdx}}{}$$

Mathematica [A] time = 1.09889, size = 288, normalized size = 1.3

$$\frac{3\sqrt{cdx+d}\sqrt{e-cex}\left(4a^2cx\sqrt{1-c^2x^2}+2ab\cos\left(2\sin^{-1}(cx)\right)-b^2\sin\left(2\sin^{-1}(cx)\right)\right)-12a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{cdx+}}{\sqrt{d}\sqrt{e}(}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*Sqrt[
e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*
Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*
(b*Cos[2*ArcSin[c*x]] + 2*a*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*ArcSin[c*x]^2*(2*a + b*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(4*a^2*c*x*Sqrt[1 - c^2*x^2] + 2*a*b*Cos[2*ArcSin[c*x]] - b^
2*Sin[2*ArcSin[c*x]]))/(24*c*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\,\sqrt{-cex+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,(a+b\,\mathrm{asin}(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

3.579 $\int \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx$

Optimal. Leaf size=432

$$\frac{2ib\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ib\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\right.}{\sqrt{1-c^2x^2}}$$

```
[Out] -2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x] - (2*a*b*c*x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSi
n[c*x])^2 - (2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2
, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.6809, antiderivative size = 432, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 9, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.257, Rules used = {4739, 4697, 4709, 4183, 2531, 2282, 6589, 4619, 261}

$$\frac{2ib\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ib\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\right.}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x] - (2*a*b*c*x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSi
n[c*x])^2 - (2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2
, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
```

```
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x}dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}dx}{\sqrt{1-c^2x^2}}$$

$$= \sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\left(a+b\sin^{-1}(c\right.}{x\sqrt{1-c^2x^2}}}{\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} + \sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(\sqrt{d\right.}{}$$

$$= -\frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d+c}$$

$$= -2b^2\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e}}{\sqrt{1-c^2}}$$

$$= -2b^2\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e}}{\sqrt{1-c^2}}$$

$$= -2b^2\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e}}{\sqrt{1-c^2}}$$

Mathematica [A] time = 2.29184, size = 434, normalized size = 1.

$$-\frac{2ab\sqrt{cdx+d}\sqrt{e-cex}\left(-i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\sqrt{1-c^2x^2}\sin^{-1}(cx)+cx-\sin^{-1}(cx)\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x] + a^2*Sqrt[d]*Sqrt[e]*Log[c*x] - a^2*Sq
rt[d]*Sqrt[e]*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]] -
(2*a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x]
 - ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*ArcSin
[c*x])] - I*PolyLog[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*x])
]))/Sqrt[1 - c^2*x^2] - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*Sqrt[1 - c^
2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - ArcSin[c*x]^
2*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] - (
2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]*PolyLog
[2, E^(I*ArcSin[c*x])] + 2*PolyLog[3, -E^(I*ArcSin[c*x])] - 2*PolyLog[3, E^
(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [F] time = 0.296, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^2}{x}\sqrt{cdx+d}\sqrt{-cex+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2 \arcsin\left(cx\right)^2 + 2\,ab \arcsin\left(cx\right) + a^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cdx + d}\sqrt{-cex + e}(b \arcsin\left(cx\right) + a)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/x, x)
```

3.580 $\int \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=257

$$-\frac{ib^2c\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^3}{3b\sqrt{1-c^2x^2}}-\frac{ic\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\right.}{\sqrt{1-c^2x^2}}$$

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2])
+ (2*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*Log[1 - E^((2*
I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.594417, antiderivative size = 257, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.229, Rules used = {4739, 4693, 4625, 3717, 2190, 2279, 2391, 4641}

$$-\frac{ib^2c\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^3}{3b\sqrt{1-c^2x^2}}-\frac{ic\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\right.}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x^2,x]
```


```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2])
+ (2*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*Log[1 - E^((2*
I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4693

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(b*c*n*Sqrt[d + e*x^2])/(f*(m + 1)*Sqr
t[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x] + Di
st[(c^2*Sqrt[d + e*x^2])/(f^2*(m + 1)*Sqrt[1 - c^2*x^2]), Int[((f*x)^(m + 2
)*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x]) /; FreeQ[{a, b, c, d, e
, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}dx = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\sqrt{1-c^2x^2}(a+b\sin^{-1}(cx))^2}{x^2}dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x} + \frac{\left(2bc\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{a+b\text{s}}{}}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \frac{c\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin\right.}{3b\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin\right.}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin\right.}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin\right.}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin\right.}{\sqrt{1-c^2x^2}}$$

Mathematica [A] time = 1.18786, size = 373, normalized size = 1.45

$$-\frac{b^2c\sqrt{cdx+d}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(3i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)\left(\frac{3\sqrt{1-c^2x^2}\sin^{-1}(cx)}{cx}+\left(\sin^{-1}(cx)+3i\right)\sin\right.\right.}{3\sqrt{1-c^2x^2}\sqrt{-(cdx+d)(e-cex)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((a^2*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/x) + a^2*c*Sqrt[d]*Sqrt[e]*
ArcTan[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 +
 c*x)*(1 + c*x))] - (a*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 -
c^2*x^2))]*((2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]^2 - 2*Log
[c*x]))/(Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2]) - (b^2*c*Sqrt[
d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(ArcSin[c*x]*((3*Sqrt
[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]*(3*I + ArcSin[c*x]) - 6*Log[
1 - E^((2*I)*ArcSin[c*x])]) + (3*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(3*
Sqrt[-((d + c*d*x)*(e - c*e*x))]*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.431, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2}\sqrt{cdx+d}\sqrt{-cex+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^{2} \arcsin\left(cx\right)^{2}+2\,ab\arcsin\left(cx\right)+a^{2}\right)\sqrt{cdx+d}\sqrt{-cex+e}}{x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{d\left(cx+1\right)}\sqrt{-e\left(cx-1\right)}\left(a+b\,\text{asin}\left(cx\right)\right)^{2}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cdx+d}\sqrt{-cex+e}\left(b\arcsin\left(cx\right)+a\right)^{2}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/x^2, x)
```

3.581 $\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=509

$$\frac{bc^3dex^6\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{18\sqrt{1-c^2x^2}}-\frac{7bcdex^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{48\sqrt{1-c^2x^2}}+\frac{1}{6}dex^3\left(1-c^2x^2\right)\sqrt{cdx+}$$

```
[Out] (-7*b^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1152*c^2) - (43*b^2*d*e*x^3
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/1728 + (b^2*c^2*d*e*x^5*Sqrt[d + c*d*x]*S
qrt[e - c*e*x])/108 + (7*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*e*x^4*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*
d*e*x^6*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c
^2*x^2]) - (d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(1
6*c^2) + (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8
+ (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/6 + (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(48*b*
c^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] time = 1.02565, antiderivative size = 509, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 12, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.343, Rules used = {4739, 4699, 4697, 4707, 4641, 4627, 321, 216, 14, 4687, 12, 459}

$$\frac{bc^3dex^6\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{18\sqrt{1-c^2x^2}}-\frac{7bcdex^4\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{48\sqrt{1-c^2x^2}}+\frac{1}{6}dex^3\left(1-c^2x^2\right)\sqrt{cdx+}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (-7*b^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1152*c^2) - (43*b^2*d*e*x^3
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/1728 + (b^2*c^2*d*e*x^5*Sqrt[d + c*d*x]*S
qrt[e - c*e*x])/108 + (7*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*e*x^4*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*
d*e*x^6*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c
^2*x^2]) - (d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(1
6*c^2) + (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8
+ (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/6 + (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(48*b*
c^3*Sqrt[1 - c^2*x^2])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4687

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rubi steps

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{\left(de\sqrt{d+\right.}{}$$

$$=-\frac{bcdex^4\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{12\sqrt{1-c^2x^2}}+\frac{bc^3dex^6\sqrt{d+cdx}}{18}$$

$$=-\frac{7bcdex^4\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{48\sqrt{1-c^2x^2}}+\frac{bc^3dex^6\sqrt{d+cdx}}{18}$$

$$=-\frac{1}{64}b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}+\frac{1}{108}b^2c^2dex^5\sqrt{d+cdx}\sqrt{e-cex}+$$

$$=\frac{b^2dex\sqrt{d+cdx}\sqrt{e-cex}}{128c^2}-\frac{43b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}}{1728}+\frac{1}{108}b^2c^2$$

$$=-\frac{7b^2dex\sqrt{d+cdx}\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}}{1728}+\frac{1}{108}b$$

$$=-\frac{7b^2dex\sqrt{d+cdx}\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}}{1728}+\frac{1}{108}b$$

Mathematica [A] time = 2.15744, size = 452, normalized size = 0.89

$$\frac{de\sqrt{cdx+d}\sqrt{e-cex}\left(-2304a^2c^5x^5\sqrt{1-c^2x^2}+4032a^2c^3x^3\sqrt{1-c^2x^2}-864a^2cx\sqrt{1-c^2x^2}+216ab\cos\left(2\sin^{-1}(cx)\right)-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (288*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 864*a^2*d^(3/2
)*e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*
ArcSin[c*x]*(-18*b*Cos[2*ArcSin[c*x]] + 9*b*Cos[4*ArcSin[c*x]] + 2*b*Cos[6*
ArcSin[c*x]] - 36*a*Sin[2*ArcSin[c*x]] + 36*a*Sin[4*ArcSin[c*x]] + 12*a*Sin
[6*ArcSin[c*x]]) - 72*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(
-12*a - 3*b*Sin[2*ArcSin[c*x]] + 3*b*Sin[4*ArcSin[c*x]] + b*Sin[6*ArcSin[c*
x]]) + d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-864*a^2*c*x*Sqrt[1 - c^2*x^2]
+ 4032*a^2*c^3*x^3*Sqrt[1 - c^2*x^2] - 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] +
 216*a*b*Cos[2*ArcSin[c*x]] - 108*a*b*Cos[4*ArcSin[c*x]] - 24*a*b*Cos[6*Arc
Sin[c*x]] - 108*b^2*Sin[2*ArcSin[c*x]] + 27*b^2*Sin[4*ArcSin[c*x]] + 4*b^2*
Sin[6*ArcSin[c*x]]))/(13824*c^3*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.616, size = 0, normalized size = 0.

$$\int x^{2} \left(c d x + d\right)^{\frac{3}{2}} \left(-c e x + e\right)^{\frac{3}{2}} \left(a + b \arcsin\left(c x\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\left(a^{2} c^{2} d e x^{4} - a^{2} d e x^{2} + \left(b^{2} c^{2} d e x^{4} - b^{2} d e x^{2}\right) \arcsin\left(c x\right)^{2} + 2 \left(a b c^{2} d e x^{4} - a b d e x^{2}\right) \arcsin\left(c x\right)\right) \sqrt{c d x + d} \sqrt{-c e x +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*e*x^4 - a^2*d*e*x^2 + (b^2*c^2*d*e*x^4 - b^2*d*e*x^2)*
arcsin(c*x)^2 + 2*(a*b*c^2*d*e*x^4 - a*b*d*e*x^2)*arcsin(c*x))*sqrt(c*d*x +
 d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2*x^2, x
)
```

3.582 $\int x(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=338

$$\frac{2bc^3dex^5\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}-\frac{4bcdex^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+\frac{2bdex\sqrt{cdx+d}\sqrt{e-cex}\left(a\right.}{5c\sqrt{1-c^2x^2}}$$

```
[Out] (16*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(75*c^2) + (8*b^2*d*e*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(225*c^2) + (2*b^2*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)^2)/(125*c^2) + (2*b*d*e*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x^2]) - (4*b*c*d*e*x
^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^
2]) + (2*b*c^3*d*e*x^5*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(25*Sqrt[1 - c^2*x^2]) - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x])^2)/(5*c^2)
```

Rubi [A] time = 0.506942, antiderivative size = 338, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212, Rules used = {4739, 4677, 194, 4645, 12, 1247, 698}

$$\frac{2bc^3dex^5\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}-\frac{4bcdex^3\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{15\sqrt{1-c^2x^2}}+\frac{2bdex\sqrt{cdx+d}\sqrt{e-cex}\left(a\right.}{5c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] (16*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(75*c^2) + (8*b^2*d*e*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(225*c^2) + (2*b^2*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)^2)/(125*c^2) + (2*b*d*e*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x^2]) - (4*b*c*d*e*x
^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^
2]) + (2*b*c^3*d*e*x^5*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(25*Sqrt[1 - c^2*x^2]) - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x])^2)/(5*c^2)
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{5c^2} + \frac{\left(2bde\sqrt{d+\right.}{}$$

$$= \frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}} - \frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-}}{15\sqrt{1}}$$

$$= \frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}} - \frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-}}{15\sqrt{1}}$$

$$= \frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}} - \frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-}}{15\sqrt{1}}$$

$$= \frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}} - \frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-}}{15\sqrt{1}}$$

$$= \frac{16b^2de\sqrt{d+cdx}\sqrt{e-cex}}{75c^2} + \frac{8b^2de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)}{225c^2} + $$

Mathematica [A] time = 0.815709, size = 207, normalized size = 0.61

$$-\frac{de\sqrt{cdx+d}\sqrt{e-cex}\left(225a^2\left(c^2x^2-1\right)^3+30abcx\sqrt{1-c^2x^2}\left(3c^4x^4-10c^2x^2+15\right)+30b\sin^{-1}(cx)\left(15a\left(c^2x^2-1\right)^3+\right.}{1125c^2\left(c^2\right.}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(225*a^2*(-1 + c^2*x^2)^3 + 30*a*b*c*
x*Sqrt[1 - c^2*x^2]*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 2*b^2*(149 - 187*c^2*x^
2 + 47*c^4*x^4 - 9*c^6*x^6) + 30*b*(15*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 -
c^2*x^2]*(15 - 10*c^2*x^2 + 3*c^4*x^4))*ArcSin[c*x] + 225*b^2*(-1 + c^2*x^2
)^3*ArcSin[c*x]^2))/(1125*c^2*(-1 + c^2*x^2))
```

Maple [F] time = 0.35, size = 0, normalized size = 0.

$$\int x\,(cdx+d)^{\frac{3}{2}}\,(-cex+e)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.53316, size = 691, normalized size = 2.04

$$-\frac{\left(9\left(25a^2-2b^2\right)c^6dex^6-\left(675a^2-94b^2\right)c^4dex^4+\left(675a^2-374b^2\right)c^2dex^2-\left(225a^2-298b^2\right)de+225\left(b^2c^6dex^6-3b^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="fricas")
```

```
[Out] -1/1125*(9*(25*a^2 - 2*b^2)*c^6*d*e*x^6 - (675*a^2 - 94*b^2)*c^4*d*e*x^4 +
(675*a^2 - 374*b^2)*c^2*d*e*x^2 - (225*a^2 - 298*b^2)*d*e + 225*(b^2*c^6*d*
e*x^6 - 3*b^2*c^4*d*e*x^4 + 3*b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c*x)^2 + 45
0*(a*b*c^6*d*e*x^6 - 3*a*b*c^4*d*e*x^4 + 3*a*b*c^2*d*e*x^2 - a*b*d*e)*arcsi
n(c*x) + 30*(3*a*b*c^5*d*e*x^5 - 10*a*b*c^3*d*e*x^3 + 15*a*b*c*d*e*x + (3*b
^2*c^5*d*e*x^5 - 10*b^2*c^3*d*e*x^3 + 15*b^2*c*d*e*x)*arcsin(c*x))*sqrt(-c^
2*x^2 + 1))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^4*x^2 - c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 2.1531, size = 1897, normalized size = 5.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="giac")
```

```
[Out] -1/108000*(7200*(c*d*x + d)^(3/2)*sqrt(-(c*d*x + d)*d*e + 2*d^2*e)*((c*d*x
+ d)*(3*(c*d*x + d)*((c*d*x + d)/(c^3*d^3) - 4/(c^3*d^2)) + 17/(c^3*d)) - 1
0/c^3)*a^2*c^2*abs(d)*e/d^2 + 960*(15*(c*d*x + d)^(3/2)*sqrt(-(c*d*x + d)*d
*e + 2*d^2*e)*((c*d*x + d)*(3*(c*d*x + d)*((c*d*x + d)/(c^3*d^3) - 4/(c^3*d
^2)) + 17/(c^3*d)) - 10/c^3)*arcsin(c*x) + (9*(c*d*x + d)^5 - 45*(c*d*x + d
)^4*d + 85*(c*d*x + d)^3*d^2 - 75*(c*d*x + d)^2*d^3)*e^(1/2)/(c^3*d^(3/2)*a
bs(d)))*a*b*c^2*abs(d)*e/d^2 + 8*(900*(c*d*x + d)^(3/2)*sqrt(-(c*d*x + d)*d
*e + 2*d^2*e)*((c*d*x + d)*(3*(c*d*x + d)*((c*d*x + d)/(c^3*d^3) - 4/(c^3*d
^2)) + 17/(c^3*d)) - 10/c^3)*arcsin(c*x)^2 - (1560*pi*d^3 - (1080*(c^2*x^2
- 1)^2*c*d^4*x*arcsin(-c*x) + 12960*(c^2*x^2 - 1)*c*d^4*x*arcsin(-c*x) + 13
50*(-c^2*x^2 + 1)^(3/2)*c*d^4*x + 5400*(c^2*x^2 - 1)^2*d^4*arcsin(-c*x) + 1
7280*c*d^4*x*arcsin(-c*x) - 216*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*d^4 - 87
75*sqrt(-c^2*x^2 + 1)*c*d^4*x + 21600*(c^2*x^2 - 1)*d^4*arcsin(-c*x) + 4320
*(-c^2*x^2 + 1)^(3/2)*d^4 + 8775*d^4*arcsin(-c*x) - 17280*sqrt(-c^2*x^2 + 1
)*d^4 - 4500*(4*c*d*x*arcsin(-c*x) - sqrt(-c^2*x^2 + 1)*c*d*x + 2*(c^2*x^2
- 1)*d*arcsin(-c*x) + d*arcsin(-c*x) - 4*sqrt(-c^2*x^2 + 1)*d)*d^3 + 1700*(
6*(c^2*x^2 - 1)*c*d^2*x*arcsin(-c*x) + 24*c*d^2*x*arcsin(-c*x) - 9*sqrt(-c^
2*x^2 + 1)*c*d^2*x + 18*(c^2*x^2 - 1)*d^2*arcsin(-c*x) + 2*(-c^2*x^2 + 1)^(
3/2)*d^2 + 9*d^2*arcsin(-c*x) - 24*sqrt(-c^2*x^2 + 1)*d^2)*d^2 - 225*(96*(c
^2*x^2 - 1)*c*d^3*x*arcsin(-c*x) + 6*(-c^2*x^2 + 1)^(3/2)*c*d^3*x + 24*(c^2
*x^2 - 1)^2*d^3*arcsin(-c*x) + 192*c*d^3*x*arcsin(-c*x) - 87*sqrt(-c^2*x^2
+ 1)*c*d^3*x + 192*(c^2*x^2 - 1)*d^3*arcsin(-c*x) + 32*(-c^2*x^2 + 1)^(3/2)
*d^3 + 87*d^3*arcsin(-c*x) - 192*sqrt(-c^2*x^2 + 1)*d^3)*d)/d)*sqrt(d)*e^(1
/2)/(c^3*abs(d)))*b^2*c^2*abs(d)*e/d^2 + 225*(c*d*x + d)^(3/2)*sqrt(-(c*d*x
 + d)*d*e + 2*d^2*e)*a^2*((c*d*x + d)*e^(-6)/d^6 - 2*e^(-6)/d^5)*abs(d)*e/(
c*d^3) + 150*(3*(c*d*x + d)^(3/2)*sqrt(-(c*d*x + d)*d*e + 2*d^2*e)*((c*d*x
+ d)*e^(-6)/d^6 - 2*e^(-6)/d^5)*arcsin(c*x) - ((c*d*x + d)^3 - 3*(c*d*x + d
)^2*d)*e^(-11/2)/(d^(9/2)*abs(d)))*a*b*abs(d)*e/(c*d^3) + 25*(9*(c*d*x + d)
^(3/2)*sqrt(-(c*d*x + d)*d*e + 2*d^2*e)*((c*d*x + d)*e^(-6)/d^6 - 2*e^(-6)/
d^5)*arcsin(c*x)^2 + sqrt(d)*(6*pi*e^(-6)/d^2 - (6*(c^2*x^2 - 1)*c*d^2*x*ar
csin(-c*x) + 24*c*d^2*x*arcsin(-c*x) - 9*sqrt(-c^2*x^2 + 1)*c*d^2*x + 18*(c
^2*x^2 - 1)*d^2*arcsin(-c*x) + 2*(-c^2*x^2 + 1)^(3/2)*d^2 + 9*d^2*arcsin(-c
*x) - 24*sqrt(-c^2*x^2 + 1)*d^2 - 9*(4*c*d*x*arcsin(-c*x) - sqrt(-c^2*x^2 +
 1)*c*d*x + 2*(c^2*x^2 - 1)*d*arcsin(-c*x) + d*arcsin(-c*x) - 4*sqrt(-c^2*x
^2 + 1)*d)*d)*e^(-6)/d^4)*e^(1/2)/abs(d))*b^2*abs(d)*e/(c*d^3))/c
```

3.583 $\int (d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=362

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{8bc\left(1-c^2x^2\right)^{3/2}}+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{8\left(1-c^2x^2\right)}+\frac{b\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex}{8c}$$

```
[Out] -(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/32 - (15*b^2*x*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (b*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (
3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*
x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*
(1 - c^2*x^2)^(3/2))
```

Rubi [A] time = 0.42222, antiderivative size = 362, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4673, 4649, 4647, 4641, 4627, 321, 216, 4677, 195}

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{8bc\left(1-c^2x^2\right)^{3/2}}+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{8\left(1-c^2x^2\right)}+\frac{b\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex}{8c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] -(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/32 - (15*b^2*x*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (b*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (
3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*
x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*
(1 - c^2*x^2)^(3/2))
```


Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4649

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(x*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n)/(2*p + 1), x] + (D
ist[(2*d*p)/(2*p + 1), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/((2*p + 1)*(1 - c^2*x
^2)^FracPart[p]), Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
```

```
GtQ[p, 0]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rubi steps

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(3(d+cdx)^{3/2}(e-cex)^{3/2}\right.}{4}$$

$$= \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin\right.}{8\left(1-c^2x^2\right)^{3/2}}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} - \frac{3bcx^2(}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} + \frac{9b^2(d}{}$$

Mathematica [A] time = 1.63099, size = 373, normalized size = 1.03

$$\frac{de\sqrt{cdx+d}\sqrt{e-cex}\left(-64a^2c^3x^3\sqrt{1-c^2x^2}+160a^2cx\sqrt{1-c^2x^2}+64ab\cos\left(2\sin^{-1}(cx)\right)+4ab\cos\left(4\sin^{-1}(cx)\right)-32b^2\text{si}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*
e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqr
t[d]*Sqrt[e]*(-1 + c^2*x^2))] + 8*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Arc
Sin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]]) + d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c^3*x^
3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c*x]]
- 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[
c*x]] + 4*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c
^2*x^2])
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\left(a^2c^2dex^2 - a^2de + \left(b^2c^2dex^2 - b^2de\right)\arcsin(cx)^2 + 2\left(abc^2dex^2 - abde\right)\arcsin(cx)\right)\sqrt{cdx+d}\sqrt{-cex+e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*
e*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

3.584 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx$

Optimal. Leaf size=647

$$\frac{2ibde\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ibde\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+\right.}{\sqrt{1-c^2x^2}}$$

```
[Out] (-22*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/9 - (2*a*b*c*d*e*x*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(1 - c^2*x^2))/27 - (2*b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*e*x^3*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2 + (d*e*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/3 - (2*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[1 - c^2*x^2] + ((2*I)*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin
[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog
[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*d*e*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.941118, antiderivative size = 647, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {4739, 4699, 4697, 4709, 4183, 2531, 2282, 6589, 4619, 261, 4645, 444, 43}

$$\frac{2ibde\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{2ibde\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+\right.}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```


```
[Out] (-22*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/9 - (2*a*b*c*d*e*x*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(1 - c^2*x^2))/27 - (2*b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*e*x^3*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2 + (d*e*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/3 - (2*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[1 - c^2*x^2] + ((2*I)*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin
[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog
[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*d*e*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
```

```
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4699

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 2*p + 1)), x] + (Dist[(2*d*p)/(m + 2*p + 1), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPart
[p]*(d + e*x^2)^FracPart[p])/(f*(m + 2*p + 1)*(1 - c^2*x^2)^FracPart[p]), I
nt[(f*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] &&
GtQ[p, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4697

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcS
in[c*x])^n)/(f*(m + 2)), x] + (Dist[Sqrt[d + e*x^2]/((m + 2)*Sqrt[1 - c^2*x
^2]), Int[((f*x)^m*(a + b*ArcSin[c*x])^n)/Sqrt[1 - c^2*x^2], x], x] - Dist[
(b*c*n*Sqrt[d + e*x^2])/(f*(m + 2)*Sqrt[1 - c^2*x^2]), Int[(f*x)^(m + 1)*(a
 + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && Eq
Q[c^2*d + e, 0] && GtQ[n, 0] &&  !LtQ[m, -1] && (RationalQ[m] || EqQ[n, 1])
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4645

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}dx = \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(de\sqrt{d+cdx}\sqrt{\right.}}{}$$

$$= -\frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{}}{9\sqrt{1}}$$

$$= -\frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\sin^{-}\right.}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cdex\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{22}{9}b^2de\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2de\sqrt{}$$

$$= -\frac{22}{9}b^2de\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2de\sqrt{}$$

$$= -\frac{22}{9}b^2de\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2de\sqrt{}$$

Mathematica [A] time = 4.94343, size = 632, normalized size = 0.98

$$-\frac{2abde\sqrt{cdx+d}\sqrt{e-cex}\left(-i\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)+i\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)-\sqrt{1-c^2x^2}\sin^{-1}(cx)+cx-\sin^{-1}(c\right.}{\sqrt{1-c^2x^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -(a^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4 + c^2*x^2))/3 + (2*a*b*d*e*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*(-3*c*x + c^3*x^3 + 3*(1 - c^2*x^2)^(3/2)*Arc
Sin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + a^2*d^(3/2)*e^(3/2)*Log[c*x] - a^2*d^(3/
2)*e^(3/2)*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]] - (2*
a*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x
] - ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*ArcSi
n[c*x])] - I*PolyLog[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*x]
)]))/Sqrt[1 - c^2*x^2] - (b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*Sqrt[1
 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - ArcSin[
c*x]^2*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])
] - (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]*Po
lyLog[2, E^(I*ArcSin[c*x])] + 2*PolyLog[3, -E^(I*ArcSin[c*x])] - 2*PolyLog[
3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(27*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^
2)*Cos[3*ArcSin[c*x]] - 6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108*S
qrt[1 - c^2*x^2])
```

Maple [F] time = 0.279, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^2}{x}(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2dex^2-a^2de+\left(b^2c^2dex^2-b^2de\right)\arcsin(cx)^2+2\left(abc^2dex^2-abde\right)\arcsin(cx)\right)\sqrt{cdx+d}\sqrt{-cex+e}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*
e*x + e)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/x, x)
```

3.585 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=505

$$-\frac{ib^2cde\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{3bc^3dex^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{cde\sqrt{cdx+d}\sqrt{e-ce}}{2b\sqrt{1-}}$$

```
[Out] (b^2*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 - (5*b^2*c*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*e*x^2
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2])
 + b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x]) - (3*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)
/2 - (I*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1
 - c^2*x^2] - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*Arc
Sin[c*x])^2)/x - (c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/
Sqrt[1 - c^2*x^2]
```

Rubi [A] time = 0.80743, antiderivative size = 505, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 14, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4739, 4695, 4647, 4641, 4627, 321, 216, 4683, 4625, 3717, 2190, 2279, 2391, 195}

$$-\frac{ib^2cde\sqrt{cdx+d}\sqrt{e-cex}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{3bc^3dex^2\sqrt{cdx+d}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{cde\sqrt{cdx+d}\sqrt{e-ce}}{2b\sqrt{1-}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```


```
[Out] (b^2*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 - (5*b^2*c*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*e*x^2
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2])
 + b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x]) - (3*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)
/2 - (I*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1
 - c^2*x^2] - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*Arc
Sin[c*x])^2)/x - (c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/
Sqrt[1 - c^2*x^2]
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4695

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^p*(a + b*ArcS
in[c*x])^n)/(f*(m + 1)), x] + (-Dist[(2*e*p)/(f^2*(m + 1)), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*c*n*d^IntPar
t[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f
*x)^(m + 1)*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0
] && LtQ[m, -1]
```

Rule 4647

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(x*Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^n)/2, x] + (Dist[Sqrt
[d + e*x^2]/(2*Sqrt[1 - c^2*x^2]), Int[(a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x
^2], x], x] - Dist[(b*c*n*Sqrt[d + e*x^2])/(2*Sqrt[1 - c^2*x^2]), Int[x*(a
+ b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4683

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[((d + e*x^2)^p*(a + b*ArcSin[c*x]))/(2*p), x] + (Dist[d,
Int[((d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]))/x, x], x] - Dist[(b*c*d^p)/(2
*p), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x} + \frac{\left(2bcde\sqrt{d+c\right.}{}$$

$$= bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{3}{2}c^2dex\sqrt{d+cd}$$

$$= -\frac{1}{2}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} + \frac{3bc^3dex^2\sqrt{d+cdx}\sqrt{e-cex}\left(a+b\,\mathrm{si}\right.}{2\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{b^2cde\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{2\sqrt{1-c^2x^2}} + \frac{3}{}$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{5b^2cde\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} +$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{5b^2cde\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} +$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{5b^2cde\sqrt{d+cdx}\sqrt{e-cex}\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} +$$

Mathematica [A] time = 2.26623, size = 538, normalized size = 1.07

$$\frac{-8ib^2cdex\sqrt{cdx+d}\sqrt{e-cex}\mathrm{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+12a^2cd^{3/2}e^{3/2}x\sqrt{1-c^2x^2}\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\left(c^2x^2-1\right)}\right)-4a^2c^2dex^2\sqrt{1}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x
]
```

```
[Out] (-8*a^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - 4*a^2*c^2*d
*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - 4*b^2*c*d*e*x*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 12*a^2*c*d^(3/2)*e^(3/2)*x*Sq
rt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[
e]*(-1 + c^2*x^2))] - 2*a*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Cos[2*A
rcSin[c*x]] + 16*a*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Log[c*x] - (8*
I)*b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c
*x])] + b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sin[2*ArcSin[c*x]] - 2*
b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(8*a*Sqrt[1 - c^2*x^2] +
b*c*x*Cos[2*ArcSin[c*x]] - 8*b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*a*c*x
*Sin[2*ArcSin[c*x]]) - 2*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^
2*(6*a*c*x + (4*I)*b*c*x + 4*b*Sqrt[1 - c^2*x^2] + b*c*x*Sin[2*ArcSin[c*x]]
))/(8*x*Sqrt[1 - c^2*x^2])
```

Maple [F] time = 0.419, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2}(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(a^2c^2dex^2 - a^2de + \left(b^2c^2dex^2 - b^2de\right)\arcsin\left(cx\right)^2 + 2\left(abc^2dex^2 - abde\right)\arcsin\left(cx\right)\right)\sqrt{cdx+d}\sqrt{-cex+e}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*
e*x + e)/x^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cdx+d\right)^{\frac{3}{2}}\left(-cex+e\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/x^2, x
)
```

3.586 $\int \frac{x^2(a+b\sin^{-1}(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=250

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc^3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{b^2x\left(1-c^2x^2\right)}{4c^2\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[Out] (b^2*x*(1 - c^2*x^2))/(4*c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*Sqrt[1
 - c^2*x^2]*ArcSin[c*x])/(4*c^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 - (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*c^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.582337, antiderivative size = 250, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.171, Rules used = {4739, 4707, 4641, 4627, 321, 216}

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{6bc^3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{b^2x\left(1-c^2x^2\right)}{4c^2\sqrt{cdx+d}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```


```
[Out] (b^2*x*(1 - c^2*x^2))/(4*c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*Sqrt[1
 - c^2*x^2]*ArcSin[c*x])/(4*c^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 - (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*c^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
```

```
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x\left(a+\ldots\right.}{c\sqrt{d+cdx}\ldots}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\left(a+b\sin\ldots\right.}{6bc^3\sqrt{d+cdx}\sqrt{e-\ldots}}$$

$$= \frac{b^2x\left(1-c^2x^2\right)}{4c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^{\ldots}}{2c^2\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{b^2x\left(1-c^2x^2\right)}{4c^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)}{4c^3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{x\left(1\ldots\right.}{\ldots}$$

Mathematica [A] time = 1.30185, size = 326, normalized size = 1.3

$$\frac{-3\sqrt{d}\sqrt{e}\left(a^2\left(4cx-4c^3x^3\right)+ab\sqrt{1-c^2x^2}+ab\cos\left(3\sin^{-1}(cx)\right)+2b^2cx\left(c^2x^2-1\right)\right)-12a^2\sqrt{cdx+d}\sqrt{e-cex}\tan^{-1}\left(\ldots\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (12*b*Sqrt[d]*Sqrt[e]*(a*Sqrt[1 - c^2*x^2] + b*c*x*(-1 + c^2*x^2))*ArcSin[c
*x]^2 + 4*b^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3 - 12*a^2*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 3*Sqrt[d]*Sqrt[e]*(a*b*Sqrt[1 - c^2*x^2]
+ 2*b^2*c*x*(-1 + c^2*x^2) + a^2*(4*c*x - 4*c^3*x^3) + a*b*Cos[3*ArcSin[c*x
```

```
]]) - 3*b*Sqrt[d]*Sqrt[e]*ArcSin[c*x]*(2*a*c*x + b*Sqrt[1 - c^2*x^2] + b*Co
s[3*ArcSin[c*x]] + 2*a*Sin[3*ArcSin[c*x]]))/(24*c^3*Sqrt[d]*Sqrt[e]*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x])
```

Maple [F] time = 0.331, size = 0, normalized size = 0.

$$\int x^2 (a + b \arcsin(cx))^2 \frac{1}{\sqrt{cdx + d}} \frac{1}{\sqrt{-cex + e}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2 x^2 \arcsin(cx)^2 + 2\,abx^2 \arcsin(cx) + a^2 x^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^2 dex^2 - de}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*
d*x + d)*sqrt(-c*e*x + e)/(c^2*d*e*x^2 - d*e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2 (a + b \operatorname{asin}(cx))^2}{\sqrt{d(cx + 1)}\sqrt{-e(cx - 1)}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))),
x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2x^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

3.587 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=177

$$\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2\left(1-c^2x^2\right)}{c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*(1
 - c^2*x^2))/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*x*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.376649, antiderivative size = 177, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {4739, 4677, 4619, 261}

$$\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2\left(1-c^2x^2\right)}{c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{cdx+d}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*(1
 - c^2*x^2))/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*x*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \left(a+b\sin^{-1}(cx)\right)\,dx}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int \sin^{-1}(cx)\,dx}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b^2\sqrt{1 \ldots\right.}{\sqrt{\ldots}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2\left(1-c^2x^2\right)}{c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2x\sqrt{1-c^2x^2}\sin^{-1}(cx)}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(1-c^2x^2\right)\left(a+\ldots\right.}{c^2\sqrt{d+cdx\ldots}}$$

Mathematica [A] time = 0.660265, size = 150, normalized size = 0.85

$$-\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(a^2\left(c^2x^2-1\right)+2abcx\sqrt{1-c^2x^2}+2b\sin^{-1}(cx)\left(a\left(c^2x^2-1\right)+bcx\sqrt{1-c^2x^2}\right)-2b^2\left(c^2x^2-1\right)+b\ldots\right.}{c^2de(cx-1)(cx+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*a*b*c*x*Sqrt[1 - c^2*x^2] + a^2*(-1 +
 c^2*x^2) - 2*b^2*(-1 + c^2*x^2) + 2*b*(b*c*x*Sqrt[1 - c^2*x^2] + a*(-1 + c
^2*x^2))*ArcSin[c*x] + b^2*(-1 + c^2*x^2)*ArcSin[c*x]^2))/(c^2*d*e*(-1 + c*
x)*(1 + c*x)))
```

Maple [F] time = 0.365, size = 0, normalized size = 0.

$$\int x\left(a+b\arcsin(cx)\right)^2\frac{1}{\sqrt{cdx+d}}\frac{1}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.3323, size = 302, normalized size = 1.71

$$-\frac{\left(\left(a^2-2\,b^2\right)c^2x^2+\left(b^2c^2x^2-b^2\right)\arcsin\left(cx\right)^2-a^2+2\,b^2+2\left(abc^2x^2-ab\right)\arcsin\left(cx\right)+2\left(b^2cx\arcsin\left(cx\right)+abcx\right)\sqrt{-c}}{c^4dex^2-c^2de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="fricas")
```

```
[Out] -((a^2 - 2*b^2)*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 + 2*b^2 +
 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x) + 2*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt
(-c^2*x^2 + 1))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^4*d*e*x^2 - c^2*d*e)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{\sqrt{d\left(cx+1\right)}\sqrt{-e\left(cx-1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2x}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

3.588 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=55

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rubi [A] time = 0.232389, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {4673, 4641}

$$\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &= \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

Mathematica [B] time = 0.647459, size = 159, normalized size = 2.89

$$\frac{-\frac{3a^2\tan^{-1}\left(\frac{cx\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\left(c^2x^2-1\right)}\right)}{\sqrt{d}\sqrt{e}}+\frac{3ab\sqrt{1-c^2x^2}\sin^{-1}(cx)^2}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{b^2\sqrt{1-c^2x^2}\sin^{-1}(cx)^3}{\sqrt{cdx+d}\sqrt{e-cex}}}{3c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
+ (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) -
 (3*a^2*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 +
 c^2*x^2))])/(Sqrt[d]*Sqrt[e]))/(3*c)
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b\arcsin(cx))^2 \frac{1}{\sqrt{cdx + d}} \frac{1}{\sqrt{-cex + e}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2\arcsin(cx)^2 + 2ab\arcsin(cx) + a^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^2dex^2 - de}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d*e*x^2 - d*e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{\sqrt{d(cx + 1)}\sqrt{-e(cx - 1)}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{\sqrt{cdx + d}\sqrt{-cex + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

3.589 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=287

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2b^2\sqrt{1}}{}$$

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((
2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])
/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E
^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*Sqrt[1 - c^2*
x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.579608, antiderivative size = 287, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.171, Rules used = {4739, 4709, 4183, 2531, 2282, 6589}

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2b^2\sqrt{1}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```


```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((
2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])
/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E
^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*Sqrt[1 - c^2*
x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int (a+bx)^2\csc(x)\,dx, x, \sin^{-1}(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (a+bx)\log\right.}{\sqrt{d+cdx}\sqrt{e-}}$$

$$= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\mathrm{Li}_2\left(\right.}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\mathrm{Li}_2\left(\right.}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\mathrm{Li}_2\left(\right.}{\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] time = 1.50283, size = 336, normalized size = 1.17

$$\frac{2ab\sqrt{1-c^2x^2}\left(i\mathrm{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)-i\mathrm{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)+\sin^{-1}(cx)\left(\log\left(1-e^{i\sin^{-1}(cx)}\right)-\log\left(1+e^{i\sin^{-1}(c\right.\right.\right.}{\sqrt{cdx+d}\sqrt{e-cex}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (a^2*Log[c*x])/(Sqrt[d]*Sqrt[e]) - (a^2*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x]])/(Sqrt[d]*Sqrt[e]) + (2*a*b*Sqrt[1 - c^2*x^2]*(ArcS
in[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + I*PolyL
og[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (b^2*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2*Log[1 - E^(I*A
rcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]
*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[
c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[3, E^(I*ArcSin[c*x])]
))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F] time = 0.289, size = 0, normalized size = 0.

$$\int \frac{(a + b \arcsin (cx))^2}{x} \frac{1}{\sqrt{cdx + d}} \frac{1}{\sqrt{-cex + e}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\left(b^2 \arcsin (cx)^2 + 2\,ab \arcsin (cx) + a^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^2dex^3 - dex}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d*e*x^3 - d*e*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin{(cx)}+a)^2}{\sqrt{cdx+d}\sqrt{-cex+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*x), x)
```

3.590 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=214

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{cdx+d}\sqrt{e-cex}}-\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{cdx+d}\sqrt{e-cex}}-\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2bc\sqrt{1-c^2x^2}}{}$$

```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) - ((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(x*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]) + (2*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.584327, antiderivative size = 214, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4739, 4681, 4625, 3717, 2190, 2279, 2391}

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{\sqrt{cdx+d}\sqrt{e-cex}}-\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{cdx+d}\sqrt{e-cex}}-\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2bc\sqrt{1-c^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```



```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) - ((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(x*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]) + (2*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4681

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] - Dist[(b*c*n*d^IntPart[p]*(d + e*x^2)^F
racPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart[p]), Int[(f*x)^(m + 1)*(1 - c
^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d,
 e, f, m, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] &
& NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \sin^{-1}(cx\right.}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(4ibc\sqrt{1-c^2x^2}\right)\text{Subs}}{\sqrt{d+}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc\sqrt{1-c^2x^2}\left(a+b\,\text{si}\right.}{\sqrt{d+}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc\sqrt{1-c^2x^2}\left(a+b\,\text{si}\right.}{\sqrt{d+}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc\sqrt{1-c^2x^2}\left(a+b\,\text{si}\right.}{\sqrt{d+}}$$

Mathematica [A] time = 1.11993, size = 189, normalized size = 0.88

$$\frac{-ib^2cx\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+a\left(ac^2x^2-a+2bcx\sqrt{1-c^2x^2}\log(cx)\right)+2b\sin^{-1}(cx)\left(ac^2x^2-a+bcx\sqrt{1-\right.}{x\sqrt{cdx+d}\sqrt{e-cex}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (b^2*(-1 + c^2*x^2 - I*c*x*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*ArcSin[c*
x]*(-a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2]*Log[1 - E^((2*I)*ArcSin[c*x])]
) + a*(-a + a*c^2*x^2 + 2*b*c*x*Sqrt[1 - c^2*x^2]*Log[c*x]) - I*b^2*c*x*Sqr
t[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(x*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x])
```

Maple [F] time = 0.526, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2}\frac{1}{\sqrt{cdx+d}}\frac{1}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^2dex^4-dex^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d*e*x^4 - d*e*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\,\mathrm{asin}(cx))^2}{x^2\sqrt{d(cx+1)}\sqrt{-e(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))),
x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{\sqrt{cdx + d}\sqrt{-cex + e}x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*x^2), x)
```

3.591 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=295

$$-\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c^3de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b\sqrt{1-c^2x^2}\,\text{lo}}{c}$$

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^3*d*e*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E
^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*S
qrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.74251, antiderivative size = 295, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.229, Rules used = {4739, 4703, 4641, 4675, 3719, 2190, 2279, 2391}

$$-\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c^3de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b\sqrt{1-c^2x^2}\,\text{lo}}{c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```


```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^3*d*e*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E
^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*S
qrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4703

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*(a +
 b*ArcSin[c*x])^n)/(2*e*(p + 1)), x] + (-Dist[(f^2*(m - 1))/(2*e*(p + 1)),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
(b*f*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1 - c^2*x^2)^Fra
cPart[p]), Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[
n, 0] && LtQ[p, -1] && GtQ[m, 1]
```

Rule 4641

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1)), x] /; Fre
eQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && NeQ[n, -1]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 \left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}dx}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}d}{cde\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx\right.}{c^3de\sqrt{d+cdx}\sqrt{}}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} +$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} +$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} +$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} +$$

Mathematica [B] time = 2.53003, size = 636, normalized size = 2.16

$$\frac{b^2\sqrt{de}\left(-6i\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-6i\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)-\sqrt{1-c^2x^2}\sin^{-1}(cx)^3-3i\sqrt{1-c^2}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
,x]
```

```
[Out] (3*a^2*c*Sqrt[d]*e*x + 3*a^2*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcTan
[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] +
3*a*b*Sqrt[d]*e*(2*c*x*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*(-ArcSin[c*x]^2 + 2*
(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Log[Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]]))) + b^2*Sqrt[d]*e*((6*I)*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*x
] + 3*c*x*ArcSin[c*x]^2 - (3*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - Sqrt[1 -
c^2*x^2]*ArcSin[c*x]^3 + 12*Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x
])] + 3*Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcSin[c*x])] + 6*Sqrt[1 - c^2*
x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*Pi*Sqrt[1 - c^2*x^2]*Log[
1 + I*E^(I*ArcSin[c*x])] + 6*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*A
rcSin[c*x])] - 12*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + 3*Pi*Sqrt[
1 - c^2*x^2]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 3*Pi*Sqrt[1 - c^2*x^2]*Log
[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])] - (6*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])]))
/(3*c^3*d^(3/2)*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F] time = 0.338, size = 0, normalized size = 0.

$$\int x^2\left(a+b\arcsin(cx)\right)^2(cdx+d)^{-\frac{3}{2}}(-cex+e)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2x^2\arcsin(cx)^2 + 2\,abx^2\arcsin(cx) + a^2x^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^4d^2e^2x^4 - 2\,c^2d^2e^2x^2 + d^2e^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*d
*x + d)*sqrt(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)^2x^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)),
 x)
```

3.592 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=244

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{4ib\sqrt{1-c^2x^2}\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)(}{c^2de\sqrt{cdx+d}\sqrt{e-}}$$

```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.4882, antiderivative size = 244, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4739, 4677, 4657, 4181, 2279, 2391}

$$-\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{4ib\sqrt{1-c^2x^2}\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)(}{c^2de\sqrt{cdx+d}\sqrt{e-}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```


```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{1-c^2x^2}\,dx}{cde\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b^2\sqrt{1-c^2\right.}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2ib^2\sqrt{1-c\right.}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ib^2\sqrt{1-c^2}}{c^2de\sqrt{d}}$$

Mathematica [A] time = 1.3472, size = 453, normalized size = 1.86

$$\frac{-2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)+2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right)+a^2+2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\sin^{-1}(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x
]
```

```
[Out] (a^2 + 2*a*b*ArcSin[c*x] + I*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + b^2*Arc
Sin[c*x]^2 - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b^2*
```

```
Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1
- c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*
x]*Log[1 + I*E^(I*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^2]*Log[-Cos[(Pi + 2
*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]] - 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*
I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*b^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x])
```

Maple [F] time = 0.38, size = 0, normalized size = 0.

$$\int x\left(a+b\arcsin\left(cx\right)\right)^{2}\left(cdx+d\right)^{-\frac{3}{2}}\left(-cex+e\right)^{-\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\sqrt{d}\sqrt{e}\int\frac{\left(b^{2}x\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^{2}+2\,abx\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right)\sqrt{cx+1}\sqrt{-cx+1}}{c^{4}d^{2}e^{2}x^{4}-2\,c^{2}d^{2}e^{2}x^{2}+d^{2}e^{2}}\,dx+\frac{}{\sqrt{-c^{2}de}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="maxima")
```

```
[Out] sqrt(d)*sqrt(e)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
^2 + 2*a*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt
(-c*x + 1)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x) + a^2/(sqrt(
-c^2*d*e*x^2 + d*e)*c^2*d*e)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^{2}x\arcsin\left(cx\right)^{2}+2\,abx\arcsin\left(cx\right)+a^{2}x\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^{4}d^{2}e^{2}x^{4}-2\,c^{2}d^{2}e^{2}x^{2}+d^{2}e^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="fricas")
```

```
[Out] integral((b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x)*sqrt(c*d*x + d
)*sqrt(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2 x}{(cdx + d)^{\frac{3}{2}} (-cex + e)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x
)
```

3.593 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=217

$$-\frac{ib^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b}{}$$

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Rubi [A] time = 0.38252, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.219, Rules used = {4673, 4651, 4675, 3719, 2190, 2279, 2391}

$$-\frac{ib^2\left(1-c^2x^2\right)^{3/2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Rule 4673

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((d + e*x)^q*(f + g*x)^q)/(1 - c^2*x
^2)^q, Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bc\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b\left(1-c^2x^2\right)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(c\right.}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4ib\left(1-c^2x^2\right)^{3/2}\right)\text{Su}}{c(d+}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b\left(1-c^2x^2\right)^{3/2}(a+}{c(d+}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b\left(1-c^2x^2\right)^{3/2}(a+}{c(d+}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b\left(1-c^2x^2\right)^{3/2}(a+}{c(d+}$$

Mathematica [B] time = 0.775721, size = 550, normalized size = 2.53

$$-2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right) - 2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\sin^{-1}(cx)}\right) + a^2cx + 2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\sin^{-1}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a^2*c*x + 2*a*b*c*x*ArcSin[c*x] + (2*I)*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + b^2*c*x*ArcSin[c*x]^2 - I*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 4*b^2*
Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^
2]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*
x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 4
*b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2
]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d*e*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b \arcsin (cx))^2 (cdx + d)^{-\frac{3}{2}} (-cex + e)^{-\frac{3}{2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2 \arcsin (cx)^2 + 2\,ab \arcsin (cx) + a^2\right)\sqrt{cdx + d}\sqrt{-cex + e}}{c^4d^2e^2x^4 - 2\,c^2d^2e^2x^2 + d^2e^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(cdx + d)^{\frac{3}{2}}(-cex + e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x)
```

3.594 $\int \frac{(a+b\sin^{-1}(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=548

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-2ib$$

```
[Out] (a + b*ArcSin[c*x])^2/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d*e*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I
*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.853429, antiderivative size = 548, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {4739, 4705, 4709, 4183, 2531, 2282, 6589, 4657, 4181, 2279, 2391}

$$\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{i\sin^{-1}(cx)}\right)\left(a+b\sin^{-1}(cx)\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-2ib$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```


```
[Out] (a + b*ArcSin[c*x])^2/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d*e*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I
*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
```

```
EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4705

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a +
b*ArcSin[c*x])^n)/(2*d*f*(p + 1)), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1)),
Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[(b*c*n
*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*f*(p + 1)*(1 - c^2*x^2)^FracPart[
p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
0] && LtQ[p, -1] &&  !GtQ[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1]
)
```

Rule 4709

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int[(a + b*x)^n*Sin
[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d +
e, 0] && GtQ[d, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 4657

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{1-c^2x^2}}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx, x, \sin^{-1}(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{\right.}}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2\sqrt{1-c^2}}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2\sqrt{1-c^2}}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2\sqrt{1-c^2}}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2\sqrt{1-c^2}}{}$$

Mathematica [A] time = 5.74661, size = 877, normalized size = 1.6

$$\frac{\sqrt{d}\sqrt{e}\log(cx)a^2 - \sqrt{d}\sqrt{e}\log\left(de+\sqrt{d}\sqrt{cxd+d}\sqrt{e-cex}\sqrt{e}\right)a^2 - \frac{\sqrt{cxd+d}\sqrt{e-cex}a^2}{c^2x^2-1} + \frac{2bde\left(\sqrt{1-c^2x^2}\log\left(1-e^{i\sin^{-1}(cx)}\right)\sin^{-1}(cx)-\sqrt{1}\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (-((a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(-1 + c^2*x^2)) + a^2*Sqrt[d]*Sqrt
[e]*Log[c*x] - a^2*Sqrt[d]*Sqrt[e]*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]] + (2*a*b*d*e*(ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x
]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*A
```

```
rcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + I*Sqr
t[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*Sqrt[1 - c^2*x^2]*PolyLog
[2, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*d*e*(I*Pi
*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 + Sqrt[1 - c^2*x^2]*ArcSin[c
*x]^2*Log[1 - E^(I*ArcSin[c*x])] - Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcS
in[c*x])] - 2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] -
Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*Log
[1 + E^(I*ArcSin[c*x])] + Pi*Sqrt[1 - c^2*x^2]*Log[-Cos[(Pi + 2*ArcSin[c*x]
)/4]] + Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (2*I)*Sqrt[
1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c^
2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*Sqrt[1 - c^2*x^2]*PolyLog
[2, I*E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, E
^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*
Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]))/(d^2*e^2)
```

Maple [F] time = 0.284, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^2}{x}(cdx+d)^{-\frac{3}{2}}(-cex+e)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^4d^2e^2x^5-2\,c^2d^2e^2x^3+d^2e^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^5 - 2*c^2*d^2*e^2*x^3 + d^2*e^2*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{(cdx + d)^{\frac{3}{2}}(-cex + e)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*x), x
)
```

3.595 $\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=396

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{4}{}$$

```
[Out] -((a + b*ArcSin[c*x])^2/(d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])) + (2*c^2*x
*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*c*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*
x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*c*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog
[2, E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] time = 0.857531, antiderivative size = 396, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {4739, 4701, 4651, 4675, 3719, 2190, 2279, 2391, 4679, 4419, 4183}

$$-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-e^{2i\sin^{-1}(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{ib^2c\sqrt{1-c^2x^2}\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{4}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```


```
[Out] -((a + b*ArcSin[c*x])^2/(d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])) + (2*c^2*x
*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*c*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*
x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*c*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog
[2, E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```


Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-((d^2*g)/e))^I
ntPart[q]*(d + e*x)^FracPart[q]*(f + g*x)^FracPart[q])/(1 - c^2*x^2)^FracPa
rt[q], Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4701

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(p + 1)*(a + b
*ArcSin[c*x])^n)/(d*f*(m + 1)), x] + (Dist[(c^2*(m + 2*p + 3))/(f^2*(m + 1)
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[(b*
c*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(f*(m + 1)*(1 - c^2*x^2)^FracPart
```

```
[p]), Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1)
, x], x]) /; FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n,
 0] && LtQ[m, -1] && IntegerQ[m]
```

Rule 4651

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[(x*(a + b*ArcSin[c*x])^n)/(d*Sqrt[d + e*x^2]), x] - Dist[(
b*c*n)/Sqrt[d], Int[(x*(a + b*ArcSin[c*x])^(n - 1))/(d + e*x^2), x], x] /;
FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[d, 0]
```

Rule 4675

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Dist[e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 3719

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^m*E^(2*I*(e
 + f*x)))/(1 + E^(2*I*(e + f*x))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4679

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4419

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\left(1-c^2x^2\right)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(1-c^2x^2\right)}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2c^2\sqrt{1-c^2x^2}\right)\int \frac{(a+b\sin}{(1-c^2}}{de\sqrt{d+cdx}\sqrt{e-c}}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\right.}{de\sqrt{d+cdx}}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(4bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\right.}{de\sqrt{d+cdx}\sqrt{e}}$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} -$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} -$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} -$$

$$= -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\sqrt{e-cex}} -$$

Mathematica [A] time = 2.47636, size = 564, normalized size = 1.42

$$\frac{c\csc\left(\frac{1}{2}\sin^{-1}(cx)\right)\sec\left(\frac{1}{2}\sin^{-1}(cx)\right)\left(-2ib^2\sin\left(2\sin^{-1}(cx)\right)\text{PolyLog}\left(2,-ie^{i\sin^{-1}(cx)}\right)-2ib^2\sin\left(2\sin^{-1}(cx)\right)\text{PolyLog}\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x
]
```

```
[Out] (c*Csc[ArcSin[c*x]/2]*Sec[ArcSin[c*x]/2]*(-2*a^2 + 4*a^2*c^2*x^2 - 4*a*b*Ar
cSin[c*x]*Cos[2*ArcSin[c*x]] - 2*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + (2*
I)*b^2*Pi*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - (2*I)*b^2*ArcSin[c*x]^2*Sin[2*Ar
cSin[c*x]] + 4*b^2*Pi*Log[1 + E^((-I)*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] + b^
2*Pi*Log[1 - I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Lo
g[1 - I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - b^2*Pi*Log[1 + I*E^(I*ArcSi
n[c*x])]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])
]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])]*Sin
[2*ArcSin[c*x]] + 2*a*b*Log[c*x]*Sin[2*ArcSin[c*x]] - 4*b^2*Pi*Log[Cos[ArcS
in[c*x]/2]]*Sin[2*ArcSin[c*x]] + b^2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]*S
in[2*ArcSin[c*x]] + 2*a*b*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[
2*ArcSin[c*x]] + 2*a*b*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[2*A
```

```
rcSin[c*x]] - b^2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]*Sin[2*ArcSin[c*x]] -
(2*I)*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - (2*I)*b^2
*PolyLog[2, I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - I*b^2*PolyLog[2, E^((
2*I)*ArcSin[c*x])]*Sin[2*ArcSin[c*x]]))/(4*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])
```

Maple [F] time = 0.49, size = 0, normalized size = 0.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2}(cdx+d)^{-\frac{3}{2}}(-cex+e)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2\right)\sqrt{cdx+d}\sqrt{-cex+e}}{c^4d^2e^2x^6-2c^2d^2e^2x^4+d^2e^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^6 - 2*c^2*d^2*e^2*x^4 + d^2*e^2*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*x^2),
 x)
```

3.596 $\int x^4 \left(d+ex^2\right) \left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=152

$$\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{b\left(1-c^2x^2\right)^{5/2}\left(7c^2d+15e\right)}{175c^7}-\frac{b\left(1-c^2x^2\right)^{3/2}\left(14c^2d+15e\right)}{105c^7}+\frac{b\sqrt{1-}}{}$$

```
[Out] (b*(7*c^2*d + 5*e)*Sqrt[1 - c^2*x^2])/(35*c^7) - (b*(14*c^2*d + 15*e)*(1 -
c^2*x^2)^(3/2))/(105*c^7) + (b*(7*c^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c
^7) - (b*e*(1 - c^2*x^2)^(7/2))/(49*c^7) + (d*x^5*(a + b*ArcSin[c*x]))/5 +
(e*x^7*(a + b*ArcSin[c*x]))/7
```

Rubi [A] time = 0.150382, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4731, 12, 446, 77}

$$\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{b\left(1-c^2x^2\right)^{5/2}\left(7c^2d+15e\right)}{175c^7}-\frac{b\left(1-c^2x^2\right)^{3/2}\left(14c^2d+15e\right)}{105c^7}+\frac{b\sqrt{1-}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(7*c^2*d + 5*e)*Sqrt[1 - c^2*x^2])/(35*c^7) - (b*(14*c^2*d + 15*e)*(1 -
c^2*x^2)^(3/2))/(105*c^7) + (b*(7*c^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c
^7) - (b*e*(1 - c^2*x^2)^(7/2))/(49*c^7) + (d*x^5*(a + b*ArcSin[c*x]))/5 +
(e*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rubi steps

$$\int x^4\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{x^5\left(7d+5ex^2\right)}{35\sqrt{1-c^2x^2}}\,dx$$
$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{35}(bc)\int\frac{x^5\left(7d+5ex^2\right)}{\sqrt{1-c^2x^2}}\,dx$$
$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bc)\,\text{Subst}\left(\int\frac{x^2(7d+5ex)}{\sqrt{1-c^2x}}\,c\right.$$
$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bc)\,\text{Subst}\left(\int\left(\frac{7c^2d+5e}{c^6\sqrt{1-c^2x}}+\right.\right.$$
$$=\frac{b\left(7c^2d+5e\right)\sqrt{1-c^2x^2}}{35c^7}-\frac{b\left(14c^2d+15e\right)\left(1-c^2x^2\right)^{3/2}}{105c^7}+\frac{b\left(7c^2d+15e\right)\left(1-c^2x^2\right)}{175c^7}$$

Mathematica [A] time = 0.114022, size = 115, normalized size = 0.76

$$\frac{105ax^5\left(7d+5ex^2\right)+\frac{b\sqrt{1-c^2x^2}\left(3c^6\left(49dx^4+25ex^6\right)+2c^4\left(98dx^2+45ex^4\right)+8c^2\left(49d+15ex^2\right)+240e\right)}{c^7}+105bx^5\sin^{-1}(cx)\left(7d+5ex^2\right)}{3675}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (105*a*x^5*(7*d + 5*e*x^2) + (b*Sqrt[1 - c^2*x^2]*(240*e + 8*c^2*(49*d + 15
*e*x^2) + 2*c^4*(98*d*x^2 + 45*e*x^4) + 3*c^6*(49*d*x^4 + 25*e*x^6)))/c^7 +
 105*b*x^5*(7*d + 5*e*x^2)*ArcSin[c*x])/3675
```

Maple [A] time = 0.005, size = 201, normalized size = 1.3

$$\frac{1}{c^5}\left(\frac{a}{c^2}\left(\frac{ec^7x^7}{7}+\frac{c^7x^5d}{5}\right)+\frac{b}{c^2}\left(\frac{\arcsin(cx)\,ec^7x^7}{7}+\frac{\arcsin(cx)\,c^7x^5d}{5}-\frac{e}{7}\left(-\frac{c^6x^6}{7}\sqrt{-c^2x^2+1}-\frac{6\,c^4x^4}{35}\sqrt{-c^2x^2+1}-\frac{8\,c^2x^2}{35}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^5*(a/c^2*(1/7*e*c^7*x^7+1/5*c^7*x^5*d)+b/c^2*(1/7*arcsin(c*x)*e*c^7*x^7
+1/5*arcsin(c*x)*c^7*x^5*d-1/7*e*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*
x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(
1/2))-1/5*c^2*d*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^
(1/2)-8/15*(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.46336, size = 247, normalized size = 1.62

$$\frac{1}{7}\,aex^7 + \frac{1}{5}\,adx^5 + \frac{1}{75}\left(15\,x^5\arcsin\left(cx\right) + \left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd + \frac{1}{245}\left(35\,x^7\,\mathrm{arc}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e*x^7 + 1/5*a*d*x^5 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1
)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d
 + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*
x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8
)*c)*b*e
```

Fricas [A] time = 2.27816, size = 308, normalized size = 2.03

$$\frac{525\,ac^7ex^7 + 735\,ac^7dx^5 + 105\left(5\,bc^7ex^7 + 7\,bc^7dx^5\right)\arcsin\left(cx\right) + \left(75\,bc^6ex^6 + 3\left(49\,bc^6d + 30\,bc^4e\right)x^4 + 392\,bc^2d + 4\right.}{3675\,c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3675*(525*a*c^7*e*x^7 + 735*a*c^7*d*x^5 + 105*(5*b*c^7*e*x^7 + 7*b*c^7*d*
x^5)*arcsin(c*x) + (75*b*c^6*e*x^6 + 3*(49*b*c^6*d + 30*b*c^4*e)*x^4 + 392*
b*c^2*d + 4*(49*b*c^4*d + 30*b*c^2*e)*x^2 + 240*b*e)*sqrt(-c^2*x^2 + 1))/c^
7
```

Sympy [A] time = 7.81841, size = 223, normalized size = 1.47

$$\begin{cases} \frac{adx^5}{5} + \frac{aex^7}{7} + \frac{bdx^5\operatorname{asin}\left(cx\right)}{5} + \frac{bex^7\operatorname{asin}\left(cx\right)}{7} + \frac{bdx^4\sqrt{-c^2x^2+1}}{25c} + \frac{bex^6\sqrt{-c^2x^2+1}}{49c} + \frac{4bdx^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{6bex^4\sqrt{-c^2x^2+1}}{245c^3} + \frac{8bd\sqrt{-c^2x^2+1}}{75c^5} + \frac{8\ldots}{} \\ a\left(\frac{dx^5}{5} + \frac{ex^7}{7}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**5/5 + a*e*x**7/7 + b*d*x**5*asin(c*x)/5 + b*e*x**7*asin(c
*x)/7 + b*d*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e*x**6*sqrt(-c**2*x**2 + 1
)/(49*c) + 4*b*d*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 6*b*e*x**4*sqrt(-c**
2*x**2 + 1)/(245*c**3) + 8*b*d*sqrt(-c**2*x**2 + 1)/(75*c**5) + 8*b*e*x**2*
sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e*sqrt(-c**2*x**2 + 1)/(245*c**7), N
e(c, 0)), (a*(d*x**5/5 + e*x**7/7), True))
```

Giac [B] time = 1.2158, size = 439, normalized size = 2.89

$$\frac{1}{7}\,ax^7e + \frac{1}{5}\,adx^5 + \frac{\left(c^2x^2-1\right)^2bdx\arcsin\left(cx\right)}{5\,c^4} + \frac{2\left(c^2x^2-1\right)bdx\arcsin\left(cx\right)}{5\,c^4} + \frac{\left(c^2x^2-1\right)^3bx\arcsin\left(cx\right)e}{7\,c^6} + \frac{bdx\,\mathrm{arcsi}}{5\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*x^7*e + 1/5*a*d*x^5 + 1/5*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^4 + 2/5
*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2 - 1)^3*b*x*arcsin(c*x)*
e/c^6 + 1/5*b*d*x*arcsin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*x*arcsin(c*x)*e/c
^6 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 3/7*(c^2*x^2 - 1)*b*
x*arcsin(c*x)*e/c^6 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*d/c^5 + 1/49*(c^2*x^2 - 1
)^3*sqrt(-c^2*x^2 + 1)*b*e/c^7 + 1/7*b*x*arcsin(c*x)*e/c^6 + 1/5*sqrt(-c^2*
x^2 + 1)*b*d/c^5 + 3/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e/c^7 - 1/7*(-
c^2*x^2 + 1)^(3/2)*b*e/c^7 + 1/7*sqrt(-c^2*x^2 + 1)*b*e/c^7
```

3.597 $\int x^3 (d+ex^2) (a+b\sin^{-1}(cx)) \, dx$

Optimal. Leaf size=149

$$\frac{1}{4}dx^4 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6 \left(a+b\sin^{-1}(cx)\right)+\frac{bx^3\sqrt{1-c^2x^2}\left(9c^2d+5e\right)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}\left(9c^2d+5e\right)}{96c^5}-\frac{b\left(9c^2d+5\right.}{96}$$

```
[Out] (b*(9*c^2*d + 5*e)*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (b*(9*c^2*d + 5*e)*x^3*S
qrt[1 - c^2*x^2])/(144*c^3) + (b*e*x^5*Sqrt[1 - c^2*x^2])/(36*c) - (b*(9*c^
2*d + 5*e)*ArcSin[c*x])/(96*c^6) + (d*x^4*(a + b*ArcSin[c*x]))/4 + (e*x^6*(
a + b*ArcSin[c*x]))/6
```

Rubi [A] time = 0.117026, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {14, 4731, 12, 459, 321, 216}

$$\frac{1}{4}dx^4 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6 \left(a+b\sin^{-1}(cx)\right)+\frac{bx^3\sqrt{1-c^2x^2}\left(9c^2d+5e\right)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}\left(9c^2d+5e\right)}{96c^5}-\frac{b\left(9c^2d+5\right.}{96}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(9*c^2*d + 5*e)*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (b*(9*c^2*d + 5*e)*x^3*S
qrt[1 - c^2*x^2])/(144*c^3) + (b*e*x^5*Sqrt[1 - c^2*x^2])/(36*c) - (b*(9*c^
2*d + 5*e)*ArcSin[c*x])/(96*c^6) + (d*x^4*(a + b*ArcSin[c*x]))/4 + (e*x^6*(
a + b*ArcSin[c*x]))/6
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x^3\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)dx = \frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{x^4\left(3d+2ex^2\right)}{12\sqrt{1-c^2x^2}}dx$$

$$=\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\sin^{-1}(cx)\right)-\frac{1}{12}(bc)\int\frac{x^4\left(3d+2ex^2\right)}{\sqrt{1-c^2x^2}}dx$$

$$=\frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\sin^{-1}(cx)\right)-\frac{1}{36}\left(bc\left(9d+\frac{5}{c}\right.\right.$$

$$=\frac{b\left(9c^2d+5e\right)x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+\right.$$

$$=\frac{b\left(9c^2d+5e\right)x\sqrt{1-c^2x^2}}{96c^5}+\frac{b\left(9c^2d+5e\right)x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{1}{4}dx^4\left(a\right.$$

$$=\frac{b\left(9c^2d+5e\right)x\sqrt{1-c^2x^2}}{96c^5}+\frac{b\left(9c^2d+5e\right)x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}-\frac{b\left(9c^2d\right.}{}$$

Mathematica [A] time = 0.0816949, size = 116, normalized size = 0.78

$$\frac{24ac^6x^4\left(3d+2ex^2\right)+bcx\sqrt{1-c^2x^2}\left(2c^4\left(9dx^2+4ex^4\right)+c^2\left(27d+10ex^2\right)+15e\right)+3b\sin^{-1}(cx)\left(8c^6\left(3dx^4+2ex^6\right)-9c\right.}{288c^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*a*c^6*x^4*(3*d + 2*e*x^2) + b*c*x*Sqrt[1 - c^2*x^2]*(15*e + c^2*(27*d +
 10*e*x^2) + 2*c^4*(9*d*x^2 + 4*e*x^4)) + 3*b*(-9*c^2*d - 5*e + 8*c^6*(3*d*
x^4 + 2*e*x^6))*ArcSin[c*x])/(288*c^6)
```

Maple [A] time = 0.006, size = 177, normalized size = 1.2

$$\frac{1}{c^4}\left(\frac{a}{c^2}\left(\frac{ec^6x^6}{6}+\frac{x^4c^6d}{4}\right)+\frac{b}{c^2}\left(\frac{\arcsin(cx)\,ec^6x^6}{6}+\frac{\arcsin(cx)\,c^6x^4d}{4}-\frac{e}{6}\left(-\frac{c^5x^5}{6}\sqrt{-c^2x^2+1}-\frac{5\,c^3x^3}{24}\sqrt{-c^2x^2+1}-\frac{5\,cx}{16}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^4*(a/c^2*(1/6*e*c^6*x^6+1/4*x^4*c^6*d)+b/c^2*(1/6*arcsin(c*x)*e*c^6*x^6
+1/4*arcsin(c*x)*c^6*x^4*d-1/6*e*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*
```

```
x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-1/4*c^
2*d*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(
c*x))))
```

Maxima [A] time = 1.47481, size = 252, normalized size = 1.69

$$\frac{1}{6}\,aex^6+\frac{1}{4}\,adx^4+\frac{1}{32}\left(8\,x^4\arcsin\left(cx\right)+\left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\,\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^4}\right)c\right)bd+\frac{1}{288}\left(48\,x^6\,\mathrm{arc}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*e*x^6 + 1/4*a*d*x^4 + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)
*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2
)*c^4))*c)*b*d + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2
+ 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c
^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*e
```

Fricas [A] time = 2.34499, size = 286, normalized size = 1.92

$$\frac{48\,ac^6ex^6+72\,ac^6dx^4+3\left(16\,bc^6ex^6+24\,bc^6dx^4-9\,bc^2d-5\,be\right)\arcsin\left(cx\right)+\left(8\,bc^5ex^5+2\left(9\,bc^5d+5\,bc^3e\right)x^3+3\,(\right.}{288\,c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*e*x^6 + 72*a*c^6*d*x^4 + 3*(16*b*c^6*e*x^6 + 24*b*c^6*d*x^4
 - 9*b*c^2*d - 5*b*e)*arcsin(c*x) + (8*b*c^5*e*x^5 + 2*(9*b*c^5*d + 5*b*c^3
*e)*x^3 + 3*(9*b*c^3*d + 5*b*c*e)*x)*sqrt(-c^2*x^2 + 1))/c^6
```

Sympy [A] time = 5.26755, size = 206, normalized size = 1.38

$$\begin{cases}\frac{adx^4}{4}+\frac{aex^6}{6}+\frac{bdx^4\operatorname{asin}\left(cx\right)}{4}+\frac{bex^6\operatorname{asin}\left(cx\right)}{6}+\frac{bdx^3\sqrt{-c^2x^2+1}}{16c}+\frac{bex^5\sqrt{-c^2x^2+1}}{36c}+\frac{3bdx\sqrt{-c^2x^2+1}}{32c^3}+\frac{5bex^3\sqrt{-c^2x^2+1}}{144c^3}-\frac{3bd\operatorname{asin}\left(cx\right)}{32c^4}+\frac{5bex}{} \\ a\left(\frac{dx^4}{4}+\frac{ex^6}{6}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**4/4 + a*e*x**6/6 + b*d*x**4*asin(c*x)/4 + b*e*x**6*asin(c
*x)/6 + b*d*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e*x**5*sqrt(-c**2*x**2 + 1
)/(36*c) + 3*b*d*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*e*x**3*sqrt(-c**2*x
**2 + 1)/(144*c**3) - 3*b*d*asin(c*x)/(32*c**4) + 5*b*e*x*sqrt(-c**2*x**2 +
 1)/(96*c**5) - 5*b*e*asin(c*x)/(96*c**6), Ne(c, 0)), (a*(d*x**4/4 + e*x**6
/6), True))
```

Giac [B] time = 1.26794, size = 454, normalized size = 3.05

$$-\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bdx}{16\,c^3}+\frac{\left(c^2x^2-1\right)^2bd\arcsin\left(cx\right)}{4\,c^4}+\frac{5\,\sqrt{-c^2x^2+1}bdx}{32\,c^3}+\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bxe}{36\,c^5}+\frac{\left(c^2x^2-1\right)^2ad}{4\,c^4}+\frac{\left(c^2x^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/16*(-c^2*x^2 + 1)^(3/2)*b*d*x/c^3 + 1/4*(c^2*x^2 - 1)^2*b*d*arcsin(c*x)/
c^4 + 5/32*sqrt(-c^2*x^2 + 1)*b*d*x/c^3 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^
2 + 1)*b*x*e/c^5 + 1/4*(c^2*x^2 - 1)^2*a*d/c^4 + 1/2*(c^2*x^2 - 1)*b*d*arcs
in(c*x)/c^4 + 1/6*(c^2*x^2 - 1)^3*b*arcsin(c*x)*e/c^6 - 13/144*(-c^2*x^2 +
1)^(3/2)*b*x*e/c^5 + 1/2*(c^2*x^2 - 1)*a*d/c^4 + 5/32*b*d*arcsin(c*x)/c^4 +
 1/6*(c^2*x^2 - 1)^3*a*e/c^6 + 1/2*(c^2*x^2 - 1)^2*b*arcsin(c*x)*e/c^6 + 11
/96*sqrt(-c^2*x^2 + 1)*b*x*e/c^5 + 1/2*(c^2*x^2 - 1)^2*a*e/c^6 + 1/2*(c^2*x
^2 - 1)*b*arcsin(c*x)*e/c^6 + 1/2*(c^2*x^2 - 1)*a*e/c^6 + 11/96*b*arcsin(c*
x)*e/c^6
```

3.598 $\int x^2 \left(d+ex^2\right) \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=120

$$\frac{1}{3}dx^3 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5 \left(a+b\sin^{-1}(cx)\right)-\frac{b\left(1-c^2x^2\right)^{3/2}\left(5c^2d+6e\right)}{45c^5}+\frac{b\sqrt{1-c^2x^2}\left(5c^2d+3e\right)}{15c^5}+\frac{be\left(1-c^2x^2\right)^{5/2}}{25c^5}$$

```
[Out] (b*(5*c^2*d + 3*e)*Sqrt[1 - c^2*x^2])/(15*c^5) - (b*(5*c^2*d + 6*e)*(1 - c^
2*x^2)^(3/2))/(45*c^5) + (b*e*(1 - c^2*x^2)^(5/2))/(25*c^5) + (d*x^3*(a + b
*ArcSin[c*x]))/3 + (e*x^5*(a + b*ArcSin[c*x]))/5
```

Rubi [A] time = 0.127109, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4731, 12, 446, 77}

$$\frac{1}{3}dx^3 \left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5 \left(a+b\sin^{-1}(cx)\right)-\frac{b\left(1-c^2x^2\right)^{3/2}\left(5c^2d+6e\right)}{45c^5}+\frac{b\sqrt{1-c^2x^2}\left(5c^2d+3e\right)}{15c^5}+\frac{be\left(1-c^2x^2\right)^{5/2}}{25c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(5*c^2*d + 3*e)*Sqrt[1 - c^2*x^2])/(15*c^5) - (b*(5*c^2*d + 6*e)*(1 - c^
2*x^2)^(3/2))/(45*c^5) + (b*e*(1 - c^2*x^2)^(5/2))/(25*c^5) + (d*x^3*(a + b
*ArcSin[c*x]))/3 + (e*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
```

```
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rubi steps

$$\begin{aligned}\int x^2\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)dx &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{x^3\left(5d+3ex^2\right)}{15\sqrt{1-c^2x^2}}dx\\ &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{15}(bc)\int\frac{x^3\left(5d+3ex^2\right)}{\sqrt{1-c^2x^2}}dx\\ &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bc)\,\mathrm{Subst}\left(\int\frac{x(5d+3ex)}{\sqrt{1-c^2x}}d\right.\\ &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bc)\,\mathrm{Subst}\left(\int\left(\frac{5c^2d+3e}{c^4\sqrt{1-c^2x}}+\right.\right.\\ &= \frac{b\left(5c^2d+3e\right)\sqrt{1-c^2x^2}}{15c^5}-\frac{b\left(5c^2d+6e\right)\left(1-c^2x^2\right)^{3/2}}{45c^5}+\frac{be\left(1-c^2x^2\right)^{5/2}}{25c^5}+\frac{1}{3}dx^3\left(a\right.\end{aligned}$$

Mathematica [A] time = 0.0906024, size = 96, normalized size = 0.8

$$\frac{1}{225}\left(15ax^3\left(5d+3ex^2\right)+\frac{b\sqrt{1-c^2x^2}\left(c^4\left(25dx^2+9ex^4\right)+2c^2\left(25d+6ex^2\right)+24e\right)}{c^5}+15bx^3\sin^{-1}(cx)\left(5d+3ex^2\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*a*x^3*(5*d + 3*e*x^2) + (b*Sqrt[1 - c^2*x^2]*(24*e + 2*c^2*(25*d + 6*e*
x^2) + c^4*(25*d*x^2 + 9*e*x^4)))/c^5 + 15*b*x^3*(5*d + 3*e*x^2)*ArcSin[c*x
])/225
```

Maple [A] time = 0.004, size = 161, normalized size = 1.3

$$\frac{1}{c^3}\left(\frac{a}{c^2}\left(\frac{ec^5x^5}{5}+\frac{c^5dx^3}{3}\right)+\frac{b}{c^2}\left(\frac{\arcsin(cx)\,ec^5x^5}{5}+\frac{\arcsin(cx)\,c^5dx^3}{3}-\frac{e}{5}\left(-\frac{c^4x^4}{5}\sqrt{-c^2x^2+1}-\frac{4\,c^2x^2}{15}\sqrt{-c^2x^2+1}-\frac{8}{15}\sqrt{-}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^3*(a/c^2*(1/5*e*c^5*x^5+1/3*c^5*d*x^3)+b/c^2*(1/5*arcsin(c*x)*e*c^5*x^5
+1/3*arcsin(c*x)*c^5*d*x^3-1/5*e*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*
x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-1/3*c^2*d*(-1/3*c^2*x^2*(-c
^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.4469, size = 192, normalized size = 1.6

$$\frac{1}{5}aex^5+\frac{1}{3}adx^3+\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd+\frac{1}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e*x^5 + 1/3*a*d*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*
x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d + 1/75*(15*x^5*arcsin(c*x) + (3*sq
rt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 +
 1)/c^6)*c)*b*e
```

Fricas [A] time = 2.38698, size = 250, normalized size = 2.08

$$\frac{45\,ac^5ex^5 + 75\,ac^5dx^3 + 15\left(3\,bc^5ex^5 + 5\,bc^5dx^3\right)\arcsin\left(cx\right) + \left(9\,bc^4ex^4 + 50\,bc^2d + \left(25\,bc^4d + 12\,bc^2e\right)x^2 + 24\,be\right)\sqrt{-}}{225\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*e*x^5 + 75*a*c^5*d*x^3 + 15*(3*b*c^5*e*x^5 + 5*b*c^5*d*x^3)
*arcsin(c*x) + (9*b*c^4*e*x^4 + 50*b*c^2*d + (25*b*c^4*d + 12*b*c^2*e)*x^2
+ 24*b*e)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 2.59258, size = 172, normalized size = 1.43

$$\begin{cases} \frac{adx^3}{3} + \frac{aex^5}{5} + \frac{bdx^3\operatorname{asin}(cx)}{3} + \frac{bex^5\operatorname{asin}(cx)}{5} + \frac{bdx^2\sqrt{-c^2x^2+1}}{9c} + \frac{bex^4\sqrt{-c^2x^2+1}}{25c} + \frac{2bd\sqrt{-c^2x^2+1}}{9c^3} + \frac{4bex^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{8be\sqrt{-c^2x^2+1}}{75c^5} & \text{for} \\ a\left(\frac{dx^3}{3} + \frac{ex^5}{5}\right) & \text{oth} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**3/3 + a*e*x**5/5 + b*d*x**3*asin(c*x)/3 + b*e*x**5*asin(c
*x)/5 + b*d*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*x**4*sqrt(-c**2*x**2 + 1)
/(25*c) + 2*b*d*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*e*x**2*sqrt(-c**2*x**2
+ 1)/(75*c**3) + 8*b*e*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d*x**
3/3 + e*x**5/5), True))
```

Giac [B] time = 1.32404, size = 293, normalized size = 2.44

$$\frac{1}{5}\,ax^5e + \frac{1}{3}\,adx^3 + \frac{\left(c^2x^2-1\right)bdx\arcsin\left(cx\right)}{3\,c^2} + \frac{bdx\arcsin\left(cx\right)}{3\,c^2} + \frac{\left(c^2x^2-1\right)^2bx\arcsin\left(cx\right)e}{5\,c^4} + \frac{2\left(c^2x^2-1\right)bx\arcsin}{5\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*x^5*e + 1/3*a*d*x^3 + 1/3*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^2 + 1/3*b
*d*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*x*arcsin(c*x)*e/c^4 + 2/5*(c^2
*x^2 - 1)*b*x*arcsin(c*x)*e/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d/c^3 + 1/5*b*
x*arcsin(c*x)*e/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*d/c^3 + 1/25*(c^2*x^2 - 1)^2
```

```
*sqrt(-c^2*x^2 + 1)*b*e/c^5 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e/c^5 + 1/5*sqrt(
-c^2*x^2 + 1)*b*e/c^5
```

3.599 $\int x\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=122

$$\frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4e}-\frac{b\left(8c^4d^2+8c^2de+3e^2\right)\sin^{-1}(cx)}{32c^4e}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)}{16c}+\frac{3bx\sqrt{1-c^2x^2}\left(2c^2d+e\right)}{32c^3}$$

```
[Out] (3*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2])/(32*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(
d + e*x^2))/(16*c) - (b*(8*c^4*d^2 + 8*c^2*d*e + 3*e^2)*ArcSin[c*x])/(32*c^
4*e) + ((d + e*x^2)^2*(a + b*ArcSin[c*x]))/(4*e)
```

Rubi [A] time = 0.0877116, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235, Rules used = {4729, 416, 388, 216}

$$\frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4e}-\frac{b\left(8c^4d^2+8c^2de+3e^2\right)\sin^{-1}(cx)}{32c^4e}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)}{16c}+\frac{3bx\sqrt{1-c^2x^2}\left(2c^2d+e\right)}{32c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```


```
[Out] (3*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2])/(32*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(
d + e*x^2))/(16*c) - (b*(8*c^4*d^2 + 8*c^2*d*e + 3*e^2)*ArcSin[c*x])/(32*c^
4*e) + ((d + e*x^2)^2*(a + b*ArcSin[c*x]))/(4*e)
```


Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 416

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(d*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1))/(b*(n*(p + q) + 1)),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x(d+ex^2)(a+b\sin^{-1}(cx))\,dx = \frac{(d+ex^2)^2(a+b\sin^{-1}(cx))}{4e} - \frac{(bc)\int\frac{(d+ex^2)^2}{\sqrt{1-c^2x^2}}dx}{4e}$$
$$= \frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c} + \frac{(d+ex^2)^2(a+b\sin^{-1}(cx))}{4e} + \frac{b\int\frac{-d(4c^2d+e)-3e(2c^2d+e)x^2}{\sqrt{1-c^2x^2}}dx}{16ce}$$
$$= \frac{3b(2c^2d+e)x\sqrt{1-c^2x^2}}{32c^3} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c} + \frac{(d+ex^2)^2(a+b\sin^{-1}(cx))}{4e} -$$
$$= \frac{3b(2c^2d+e)x\sqrt{1-c^2x^2}}{32c^3} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c} - \frac{b(8c^4d^2+8c^2de+3e^2)\sin^{-1}(}{32c^4e}$$

Mathematica [A] time = 0.064129, size = 95, normalized size = 0.78

$$\frac{cx\left(8ac^3x(2d+ex^2)+b\sqrt{1-c^2x^2}(2c^2(4d+ex^2)+3e)\right)+b\sin^{-1}(cx)(8c^4(2dx^2+ex^4)-8c^2d-3e)}{32c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(8*a*c^3*x*(2*d + e*x^2) + b*Sqrt[1 - c^2*x^2]*(3*e + 2*c^2*(4*d + e*x
^2))) + b*(-8*c^2*d - 3*e + 8*c^4*(2*d*x^2 + e*x^4))*ArcSin[c*x])/(32*c^4)
```

Maple [A] time = 0.005, size = 137, normalized size = 1.1

$$\frac{1}{c^2}\left(\frac{a}{c^2}\left(\frac{ec^4x^4}{4}+\frac{x^2c^4d}{2}\right)+\frac{b}{c^2}\left(\frac{\arcsin(cx)ec^4x^4}{4}+\frac{\arcsin(cx)dc^4x^2}{2}-\frac{e}{4}\left(-\frac{c^3x^3}{4}\sqrt{-c^2x^2+1}-\frac{3cx}{8}\sqrt{-c^2x^2+1}+\frac{3\,\mathrm{arcsi}}{8}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^2*(a/c^2*(1/4*e*c^4*x^4+1/2*x^2*c^4*d)+b/c^2*(1/4*arcsin(c*x)*e*c^4*x^4
+1/2*arcsin(c*x)*d*c^4*x^2-1/4*e*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(
-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-1/2*c^2*d*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1
/2*arcsin(c*x))))
```

Maxima [A] time = 1.44875, size = 197, normalized size = 1.61

$$\frac{1}{4}aex^4+\frac{1}{2}adx^2+\frac{1}{4}\left(2x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^2}\right)\right)bd+\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*e*x^4 + 1/2*a*d*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*
x/c^2 - arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^2)))*b*d + 1/32*(8*x^4*arcsin(
```

```
c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsi
n(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*e
```

Fricas [A] time = 2.34698, size = 234, normalized size = 1.92

$$\frac{8\,ac^4ex^4+16\,ac^4dx^2+\left(8\,bc^4ex^4+16\,bc^4dx^2-8\,bc^2d-3\,be\right)\arcsin\left(cx\right)+\left(2\,bc^3ex^3+\left(8\,bc^3d+3\,bce\right)x\right)\sqrt{-c^2x^2+1}}{32\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/32*(8*a*c^4*e*x^4 + 16*a*c^4*d*x^2 + (8*b*c^4*e*x^4 + 16*b*c^4*d*x^2 - 8*
b*c^2*d - 3*b*e)*arcsin(c*x) + (2*b*c^3*e*x^3 + (8*b*c^3*d + 3*b*c*e)*x)*sq
rt(-c^2*x^2 + 1))/c^4
```

Sympy [A] time = 1.39518, size = 153, normalized size = 1.25

$$\begin{cases} \frac{adx^2}{2}+\frac{aex^4}{4}+\frac{bdx^2\operatorname{asin}(cx)}{2}+\frac{bex^4\operatorname{asin}(cx)}{4}+\frac{bdx\sqrt{-c^2x^2+1}}{4c}+\frac{bex^3\sqrt{-c^2x^2+1}}{16c}-\frac{bd\operatorname{asin}(cx)}{4c^2}+\frac{3bex\sqrt{-c^2x^2+1}}{32c^3}-\frac{3be\operatorname{asin}(cx)}{32c^4} & \text{for } c\neq 0 \\ a\left(\frac{dx^2}{2}+\frac{ex^4}{4}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**2/2 + a*e*x**4/4 + b*d*x**2*asin(c*x)/2 + b*e*x**4*asin(c
*x)/4 + b*d*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*x**3*sqrt(-c**2*x**2 + 1)/(1
6*c) - b*d*asin(c*x)/(4*c**2) + 3*b*e*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*
b*e*asin(c*x)/(32*c**4), Ne(c, 0)), (a*(d*x**2/2 + e*x**4/4), True))
```

Giac [A] time = 1.27177, size = 273, normalized size = 2.24

$$\frac{\sqrt{-c^2x^2+1}bdx}{4\,c}+\frac{\left(c^2x^2-1\right)bd\arcsin\left(cx\right)}{2\,c^2}-\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bxe}{16\,c^3}+\frac{\left(c^2x^2-1\right)ad}{2\,c^2}+\frac{bd\arcsin\left(cx\right)}{4\,c^2}+\frac{\left(c^2x^2-1\right)^2b\arcsin}{4\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(-c^2*x^2 + 1)*b*d*x/c + 1/2*(c^2*x^2 - 1)*b*d*arcsin(c*x)/c^2 - 1/
16*(-c^2*x^2 + 1)^(3/2)*b*x*e/c^3 + 1/2*(c^2*x^2 - 1)*a*d/c^2 + 1/4*b*d*arc
sin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*arcsin(c*x)*e/c^4 + 5/32*sqrt(-c^2*x^2
 + 1)*b*x*e/c^3 + 1/4*(c^2*x^2 - 1)^2*a*e/c^4 + 1/2*(c^2*x^2 - 1)*b*arcsin(
c*x)*e/c^4 + 1/2*(c^2*x^2 - 1)*a*e/c^4 + 5/32*b*arcsin(c*x)*e/c^4
```

3.600 $\int \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=81

$$dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{b\sqrt{1-c^2x^2}\left(3c^2d+e\right)}{3c^3}-\frac{be\left(1-c^2x^2\right)^{3/2}}{9c^3}$$

```
[Out] (b*(3*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e*(1 - c^2*x^2)^(3/2))/(9*
c^3) + d*x*(a + b*ArcSin[c*x]) + (e*x^3*(a + b*ArcSin[c*x]))/3
```

Rubi [A] time = 0.0650839, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4665, 444, 43}

$$dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{b\sqrt{1-c^2x^2}\left(3c^2d+e\right)}{3c^3}-\frac{be\left(1-c^2x^2\right)^{3/2}}{9c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(3*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e*(1 - c^2*x^2)^(3/2))/(9*
c^3) + d*x*(a + b*ArcSin[c*x]) + (e*x^3*(a + b*ArcSin[c*x]))/3
```

Rule 4665

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)dx = dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)-(bc)\int \frac{x\left(d+\frac{ex^2}{3}\right)}{\sqrt{1-c^2x^2}}dx$$
$$= dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{d+\frac{ex}{3}}{\sqrt{1-c^2x}}dx,x,x^2\right.$$
$$= dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int\left(\frac{3c^2d+e}{3c^2\sqrt{1-c^2x}}-\frac{e}{\ldots}\right.\right.$$
$$= \frac{b\left(3c^2d+e\right)\sqrt{1-c^2x^2}}{3c^3}-\frac{be\left(1-c^2x^2\right)^{3/2}}{9c^3}+dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}\ldots\right.$$

Mathematica [A] time = 0.0648068, size = 71, normalized size = 0.88

$$\frac{1}{9}\left(3ax\left(3d+ex^2\right)+\frac{b\sqrt{1-c^2x^2}\left(c^2\left(9d+ex^2\right)+2e\right)}{c^3}+3bx\sin^{-1}(cx)\left(3d+ex^2\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*a*x*(3*d + e*x^2) + (b*Sqrt[1 - c^2*x^2]*(2*e + c^2*(9*d + e*x^2)))/c^3
+ 3*b*x*(3*d + e*x^2)*ArcSin[c*x])/9
```

Maple [A] time = 0.003, size = 111, normalized size = 1.4

$$\frac{1}{c}\left(\frac{a}{c^2}\left(\frac{c^3x^3e}{3}+dc^3x\right)+\frac{b}{c^2}\left(\frac{\arcsin(cx)\,c^3x^3e}{3}+\arcsin(cx)\,dc^3x-\frac{e}{3}\left(-\frac{c^2x^2}{3}\sqrt{-c^2x^2+1}-\frac{2}{3}\sqrt{-c^2x^2+1}\right)+c^2d\sqrt{-c^2x\ldots}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(a/c^2*(1/3*c^3*x^3*e+d*c^3*x)+b/c^2*(1/3*arcsin(c*x)*c^3*x^3*e+arcsin(
c*x)*d*c^3*x-1/3*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))
+c^2*d*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.44238, size = 123, normalized size = 1.52

$$\frac{1}{3}aex^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be+adx+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bd}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/3*a*e*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sq
rt(-c^2*x^2 + 1)/c^4))*b*e + a*d*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))
*b*d/c
```

Fricas [A] time = 2.49835, size = 186, normalized size = 2.3

$$\frac{3\,ac^3ex^3 + 9\,ac^3dx + 3\left(bc^3ex^3 + 3\,bc^3dx\right)\arcsin\left(cx\right) + \left(bc^2ex^2 + 9\,bc^2d + 2\,be\right)\sqrt{-c^2x^2 + 1}}{9\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*a*c^3*e*x^3 + 9*a*c^3*d*x + 3*(b*c^3*e*x^3 + 3*b*c^3*d*x)*arcsin(c*x
) + (b*c^2*e*x^2 + 9*b*c^2*d + 2*b*e)*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] time = 0.688513, size = 109, normalized size = 1.35

$$\begin{cases} adx + \frac{aex^3}{3} + bdx\operatorname{asin}\left(cx\right) + \frac{bex^3\operatorname{asin}\left(cx\right)}{3} + \frac{bd\sqrt{-c^2x^2+1}}{c} + \frac{bex^2\sqrt{-c^2x^2+1}}{9c} + \frac{2be\sqrt{-c^2x^2+1}}{9c^3} & \text{for}\ c \neq 0 \\ a\left(dx + \frac{ex^3}{3}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x + a*e*x**3/3 + b*d*x*asin(c*x) + b*e*x**3*asin(c*x)/3 + b*
d*sqrt(-c**2*x**2 + 1)/c + b*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 2*b*e*sqrt
(-c**2*x**2 + 1)/(9*c**3), Ne(c, 0)), (a*(d*x + e*x**3/3), True))
```

Giac [A] time = 1.23239, size = 154, normalized size = 1.9

$$\frac{1}{3}\,ax^3e + bdx\arcsin\left(cx\right) + adx + \frac{\left(c^2x^2 - 1\right)bx\arcsin\left(cx\right)e}{3\,c^2} + \frac{bx\arcsin\left(cx\right)e}{3\,c^2} + \frac{\sqrt{-c^2x^2 + 1}bd}{c} - \frac{\left(-c^2x^2 + 1\right)^{\frac{3}{2}}be}{9\,c^3} + \frac{\sqrt{-c}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/3*a*x^3*e + b*d*x*arcsin(c*x) + a*d*x + 1/3*(c^2*x^2 - 1)*b*x*arcsin(c*x)
*e/c^2 + 1/3*b*x*arcsin(c*x)*e/c^2 + sqrt(-c^2*x^2 + 1)*b*d/c - 1/9*(-c^2*x
^2 + 1)^(3/2)*b*e/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e/c^3
```

3.601 $\int \frac{(d+ex^2)(a+b\sin^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=132

$$-\frac{1}{2}ibd\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+d\log(x)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-$$

```
[Out] (b*e*x*Sqrt[1 - c^2*x^2])/(4*c) - (b*e*ArcSin[c*x])/(4*c^2) - (I/2)*b*d*Arc
Sin[c*x]^2 + (e*x^2*(a + b*ArcSin[c*x]))/2 + b*d*ArcSin[c*x]*Log[1 - E^((2*
I)*ArcSin[c*x])] - b*d*ArcSin[c*x]*Log[x] + d*(a + b*ArcSin[c*x])*Log[x] -
(I/2)*b*d*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.238765, antiderivative size = 132, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 12, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.632, Rules used = {14, 4731, 12, 6742, 321, 216, 2326, 4625, 3717, 2190, 2279, 2391}

$$-\frac{1}{2}ibd\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+d\log(x)\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (b*e*x*Sqrt[1 - c^2*x^2])/(4*c) - (b*e*ArcSin[c*x])/(4*c^2) - (I/2)*b*d*Arc
Sin[c*x]^2 + (e*x^2*(a + b*ArcSin[c*x]))/2 + b*d*ArcSin[c*x]*Log[1 - E^((2*
I)*ArcSin[c*x])] - b*d*ArcSin[c*x]*Log[x] + d*(a + b*ArcSin[c*x])*Log[x] -
(I/2)*b*d*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
```

```
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\sin^{-1}(cx))}{x}\,dx = \frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+d\left(a+b\sin^{-1}(cx)\right)\log(x)-(bc)\int\frac{ex^2+2d\log(x)}{2\sqrt{1-c^2x^2}}\,dx$$
$$=\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+d\left(a+b\sin^{-1}(cx)\right)\log(x)-\frac{1}{2}(bc)\int\frac{ex^2+2d\log(x)}{\sqrt{1-c^2x^2}}\,dx$$
$$=\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+d\left(a+b\sin^{-1}(cx)\right)\log(x)-\frac{1}{2}(bc)\int\left(\frac{ex^2}{\sqrt{1-c^2x^2}}+\frac{2d\log}{\sqrt{1-}}\right.$$
$$=\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+d\left(a+b\sin^{-1}(cx)\right)\log(x)-(bcd)\int\frac{\log(x)}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{2}(bc$$
$$=\frac{bex\sqrt{1-c^2x^2}}{4c}+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)-bd\sin^{-1}(cx)\log(x)+d\left(a+b\sin^{-1}(cx)\right)$$
$$=\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)-bd\sin^{-1}(cx)\log(x)+d\left(a\right.$$
$$=\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)-bd\sin^{-}$$
$$=\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+bd\sin^{-}$$
$$=\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+bd\sin^{-}$$
$$=\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\left(a+b\sin^{-1}(cx)\right)+bd\sin^{-}$$

Mathematica [A] time = 0.200342, size = 108, normalized size = 0.82

$$\frac{1}{2}\left(-ibd\left(\sin^{-1}(cx)^2+\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right)+2ad\log(x)+aex^2+\frac{be\left(cx\sqrt{1-c^2x^2}-\sin^{-1}(cx)\right)}{2c^2}+2bd\sin^{-1}(cx)\,\text{lo}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (a*e*x^2 + (b*e*(c*x*Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(2*c^2) + b*e*x^2*Ar
cSin[c*x] + 2*b*d*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*a*d*Log[x]
 - I*b*d*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])]))/2
```

Maple [A] time = 0.205, size = 177, normalized size = 1.3

$$\frac{ax^2e}{2}+da\ln(cx)-\frac{i}{2}bd(\arcsin(cx))^2+\frac{bex}{4c}\sqrt{-c^2x^2+1}+\frac{b\arcsin(cx)\,x^2e}{2}-\frac{be\arcsin(cx)}{4c^2}+db\arcsin(cx)\ln\left(1+i\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x,x)
```

```
[Out] 1/2*a*x^2*e+d*a*ln(c*x)-1/2*I*b*d*arcsin(c*x)^2+1/4*b*e*x*(-c^2*x^2+1)^(1/2
)/c+1/2*b*arcsin(c*x)*x^2*e-1/4*b*e*arcsin(c*x)/c^2+d*b*arcsin(c*x)*ln(1+I*
c*x+(-c^2*x^2+1)^(1/2))+d*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*d*
b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d*b*polylog(2,I*c*x+(-c^2*x^2+1)^(
1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}aex^2 + ad\log(x) + \int \frac{(bex^2 + bd)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/2*a*e*x^2 + a*d*log(x) + integrate((b*e*x^2 + b*d)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{aex^2 + ad + (bex^2 + bd)\arcsin(cx)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\,\text{asin}(cx))(d + ex^2)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^2 + d)(b\arcsin(cx) + a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)/x, x)
```

3.602 $\int \frac{(d+ex^2)(a+b\sin^{-1}(cx))}{x^2}\,dx$

Optimal. Leaf size=66

$$-\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}+ex\left(a+b\sin^{-1}(cx)\right)-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be\sqrt{1-c^2x^2}}{c}$$

```
[Out] (b*e*Sqrt[1 - c^2*x^2])/c - (d*(a + b*ArcSin[c*x]))/x + e*x*(a + b*ArcSin[c
*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rubi [A] time = 0.0773946, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {14, 4731, 446, 80, 63, 208}

$$-\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}+ex\left(a+b\sin^{-1}(cx)\right)-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be\sqrt{1-c^2x^2}}{c}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*Sqrt[1 - c^2*x^2])/c - (d*(a + b*ArcSin[c*x]))/x + e*x*(a + b*ArcSin[c
*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx &= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}+ex\left(a+b\sin^{-1}(cx)\right)-(bc)\int \frac{-d+ex^2}{x\sqrt{1-c^2x^2}}\,dx\\ &= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}+ex\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{-d+ex}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)\\ &= \frac{be\sqrt{1-c^2x^2}}{c}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}+ex\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}(bcd)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c\ldots}}\right.\\ &= \frac{be\sqrt{1-c^2x^2}}{c}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}+ex\left(a+b\sin^{-1}(cx)\right)-\frac{(bd)\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\ldots\right.}{c}\\ &= \frac{be\sqrt{1-c^2x^2}}{c}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{x}+ex\left(a+b\sin^{-1}(cx)\right)-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)\end{aligned}$$

Mathematica [A] time = 0.0546412, size = 71, normalized size = 1.08

$$-\frac{ad}{x}+aex-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be\sqrt{1-c^2x^2}}{c}-\frac{bd\sin^{-1}(cx)}{x}+bex\sin^{-1}(cx)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*d)/x) + a*e*x + (b*e*Sqrt[1 - c^2*x^2])/c - (b*d*ArcSin[c*x])/x + b*e*
x*ArcSin[c*x] - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A] time = 0.008, size = 79, normalized size = 1.2

$$c\left(\frac{a}{c^2}\left(ecx-\frac{dc}{x}\right)+\frac{b}{c^2}\left(\arcsin(cx)\,ecx-\frac{\arcsin(cx)\,cd}{x}+e\sqrt{-c^2x^2+1}-c^2d\,\text{Artanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] c*(a/c^2*(e*c*x-c*d/x)+b/c^2*(arcsin(c*x)*e*c*x-arcsin(c*x)*c*d/x+e*(-c^2*x
^2+1)^(1/2)-c^2*d*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.43747, size = 107, normalized size = 1.62

$$-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd+aex+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)be}{c}-\frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d + a*e*
x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*e/c - a*d/x
```

Fricas [A] time = 3.09, size = 244, normalized size = 3.7

$$-\frac{bc^2dx\log\left(\sqrt{-c^2x^2+1}+1\right)-bc^2dx\log\left(\sqrt{-c^2x^2+1}-1\right)-2\,acex^2-2\,\sqrt{-c^2x^2+1}bex+2\,acd-2\left(bcex^2-bcd\right)\mathrm{arc}}{2\,cx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/2*(b*c^2*d*x*log(sqrt(-c^2*x^2 + 1) + 1) - b*c^2*d*x*log(sqrt(-c^2*x^2 +
 1) - 1) - 2*a*c*e*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*e*x + 2*a*c*d - 2*(b*c*e*x^
2 - b*c*d)*arcsin(c*x))/(c*x)
```

Sympy [A] time = 4.11549, size = 75, normalized size = 1.14

$$-\frac{ad}{x}+aex+bcd\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)-\frac{bd\operatorname{asin}(cx)}{x}+be\left(\begin{cases}0 & \text{for}\ c=0\\ x\operatorname{asin}(cx)+\frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d/x + a*e*x + b*c*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (
I*asin(1/(c*x)), True)) - b*d*asin(c*x)/x + b*e*Piecewise((0, Eq(c, 0)), (x
*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True))
```

Giac [B] time = 1.75348, size = 1399, normalized size = 21.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^6*d*x^4*arcsin(c*x)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(
sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/2*a*c^6*d*x^4/((c^
4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c
```

```
^2*x^2 + 1) + 1)^4) + b*c^5*d*x^3*log(abs(c)*abs(x))/((c^4*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3
) - b*c^5*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - b*c^4
*d*x^2*arcsin(c*x)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - a*c^4*d*x^2/((c^4*x^3/(sqrt(-c
^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
1)^2) + b*c^3*d*x*log(abs(c)*abs(x))/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^3*d*x*log(
sqrt(-c^2*x^2 + 1) + 1)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c^2*d*arcsin(c*x)/(c^
4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1)) - b*c^3*
x^3*e/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1)
)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 2*b*c^2*x^2*arcsin(c*x)*e/((c^4*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
 1)^2) - 1/2*a*c^2*d/(c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2
*x^2 + 1) + 1)) + 2*a*c^2*x^2*e/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c*x*e/((c^4*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1))
```

3.603 $\int \frac{(d+ex^2)(a+b\sin^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=119

$$-\frac{1}{2}ibe\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{d\left(a+b\sin^{-1}(cx)\right)}{2x^2}+e\log(x)\left(a+b\sin^{-1}(cx)\right)-\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}ibe\sin^{-1}(cx)^2+b$$

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(2*x) - (I/2)*b*e*ArcSin[c*x]^2 - (d*(a + b*ArcS
in[c*x]))/(2*x^2) + b*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - b*e*Ar
cSin[c*x]*Log[x] + e*(a + b*ArcSin[c*x])*Log[x] - (I/2)*b*e*PolyLog[2, E^((
2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.22312, antiderivative size = 119, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.526, Rules used = {14, 4731, 6742, 264, 2326, 4625, 3717, 2190, 2279, 2391}

$$-\frac{1}{2}ibe\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{d\left(a+b\sin^{-1}(cx)\right)}{2x^2}+e\log(x)\left(a+b\sin^{-1}(cx)\right)-\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}ibe\sin^{-1}(cx)^2+b$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(2*x) - (I/2)*b*e*ArcSin[c*x]^2 - (d*(a + b*ArcS
in[c*x]))/(2*x^2) + b*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - b*e*Ar
cSin[c*x]*Log[x] + e*(a + b*ArcSin[c*x])*Log[x] - (I/2)*b*e*PolyLog[2, E^((
2*I)*ArcSin[c*x])]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d(a+b\sin^{-1}(cx))}{2x^2} + e(a+b\sin^{-1}(cx))\log(x) - (bc)\int \frac{-\frac{d}{2x^2}+e\log(x)}{\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{2x^2} + e(a+b\sin^{-1}(cx))\log(x) - (bc)\int\left(-\frac{d}{2x^2\sqrt{1-c^2x^2}} + \frac{e\log}{\sqrt{1-}}\right.$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{2x^2} + e(a+b\sin^{-1}(cx))\log(x) + \frac{1}{2}(bcd)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx - (bc$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{d(a+b\sin^{-1}(cx))}{2x^2} - be\sin^{-1}(cx)\log(x) + e(a+b\sin^{-1}(cx))\log$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{d(a+b\sin^{-1}(cx))}{2x^2} - be\sin^{-1}(cx)\log(x) + e(a+b\sin^{-1}(cx))\log$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} - be\sin^{-1}(cx)\log(x) + e(a$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} + be\sin^{-1}(cx)\log\left(1-e^{2is}\right.$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} + be\sin^{-1}(cx)\log\left(1-e^{2is}\right.$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} + be\sin^{-1}(cx)\log\left(1-e^{2is}\right.$$

Mathematica [A] time = 0.109742, size = 104, normalized size = 0.87

$$-\frac{ibex^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right) + ad - 2aex^2\log(x) + bcdx\sqrt{1-c^2x^2} + b\sin^{-1}(cx)\left(d-2ex^2\log\left(1-e^{2i\sin^{-1}(cx)}\right)\right) + ib}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(a*d + b*c*d*x*Sqrt[1 - c^2*x^2] + I*b*e*x^2*ArcSin[c*x]^2 + b*ArcSin[c*x]
*(d - 2*e*x^2*Log[1 - E^((2*I)*ArcSin[c*x])]) - 2*a*e*x^2*Log[x] + I*b*e*x^
2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(2*x^2)
```

Maple [A] time = 0.287, size = 174, normalized size = 1.5

$$-\frac{ad}{2x^2} + ae\ln(cx) - \frac{i}{2}be(\arcsin(cx))^2 + \frac{i}{2}c^2bd - \frac{bcd}{2x}\sqrt{-c^2x^2+1} - \frac{bd\arcsin(cx)}{2x^2} + be\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] -1/2*a*d/x^2+a*e*ln(c*x)-1/2*I*b*e*arcsin(c*x)^2+1/2*I*c^2*b*d-1/2*b*c*d*(-
c^2*x^2+1)^(1/2)/x-1/2*b*arcsin(c*x)*d/x^2+b*e*arcsin(c*x)*ln(1+I*c*x+(-c^2
*x^2+1)^(1/2))+b*e*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*b*e*polylog
(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*b*e*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,bd\left(\frac{\sqrt{-c^2x^2+1}c}{x}+\frac{\arcsin(cx)}{x^2}\right)+be\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,dx+ae\log(x)-\frac{ad}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) + b*e*integrate(arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) + a*e*log(x) - 1/2*a*d/x^2
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{aex^2+ad+\left(bex^2+bd\right)\arcsin(cx)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\,\mathrm{asin}(cx))\left(d+ex^2\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(ex^2+d\right)(b\arcsin(cx)+a)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)/x^3, x)
```

3.604 $\int \frac{(d+ex^2)(a+b\sin^{-1}(cx))}{x^4} dx$

Optimal. Leaf size=85

$$-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{6}bc\left(c^2d+6e\right)\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}$$

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (d*(a + b*ArcSin[c*x]))/(3*x^3) - (e*(
a + b*ArcSin[c*x]))/x - (b*c*(c^2*d + 6*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rubi [A] time = 0.0865374, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {14, 4731, 12, 446, 78, 63, 208}

$$-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{6}bc\left(c^2d+6e\right)\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (d*(a + b*ArcSin[c*x]))/(3*x^3) - (e*(
a + b*ArcSin[c*x]))/x - (b*c*(c^2*d + 6*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
```

```
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx &= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}-(bc)\int\frac{-d-3ex^2}{3x^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{3}(bc)\int\frac{-d-3ex^2}{x^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{6}(bc)\,\mathrm{Subst}\left(\int\frac{-d-3ex}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}+\frac{1}{12}\left(bc\left(c^2d+6e\right)\right)\mathrm{Subs} \\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{\left(b\left(c^2d+6e\right)\right)\mathrm{Subst}\left(\int\right.}{6} \\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{1}{6}bc\left(c^2d+6e\right)\tanh^{-1}\left(\right.
\end{aligned}$$

Mathematica [A] time = 0.0466527, size = 109, normalized size = 1.28

$$-\frac{ad}{3x^3}-\frac{ae}{x}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{1}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-bce\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-\frac{bd\sin^{-1}(cx)}{3x^3}-\frac{be\sin^{-1}(cx)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -(a*d)/(3*x^3) - (a*e)/x - (b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (b*d*ArcSin[
c*x])/(3*x^3) - (b*e*ArcSin[c*x])/x - (b*c^3*d*ArcTanh[Sqrt[1 - c^2*x^2]])/
6 - b*c*e*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A] time = 0.01, size = 120, normalized size = 1.4

$$c^3\left(\frac{a}{c^2}\left(-\frac{e}{cx}-\frac{d}{3\,cx^3}\right)+\frac{b}{c^2}\left(-\frac{\arcsin(cx)\,e}{cx}-\frac{\arcsin(cx)\,d}{3\,cx^3}+\frac{c^2d}{3}\left(-\frac{1}{2\,c^2x^2}\sqrt{-c^2x^2+1}-\frac{1}{2}\mathrm{Artanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)-e\mathrm{Ar}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] c^3*(a/c^2*(-e/c/x-1/3/c*d/x^3)+b/c^2*(-arcsin(c*x)*e/c/x-1/3*arcsin(c*x)/c
*d/x^3+1/3*c^2*d*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*arctanh(1/(-c^2*x^2+1
)^(1/2)))-e*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.43939, size = 161, normalized size = 1.89

$$-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bc$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)
/x^2)*c + 2*arcsin(c*x)/x^3)*b*d - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/a
bs(x)) + arcsin(c*x)/x)*b*e - a*e/x - 1/3*a*d/x^3
```

Fricas [A] time = 2.45683, size = 277, normalized size = 3.26

$$-\frac{\left(bc^3d+6\,bce\right)x^3\log\left(\sqrt{-c^2x^2+1}+1\right)-\left(bc^3d+6\,bce\right)x^3\log\left(\sqrt{-c^2x^2+1}-1\right)+2\sqrt{-c^2x^2+1}bcdx+12\,aex^2+4\,ad}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/12*((b*c^3*d + 6*b*c*e)*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - (b*c^3*d + 6*b
*c*e)*x^3*log(sqrt(-c^2*x^2 + 1) - 1) + 2*sqrt(-c^2*x^2 + 1)*b*c*d*x + 12*a
*e*x^2 + 4*a*d + 4*(3*b*e*x^2 + b*d)*arcsin(c*x))/x^3
```

Sympy [A] time = 5.27227, size = 170, normalized size = 2.

$$-\frac{ad}{3x^3}-\frac{ae}{x}+\frac{bcd\left(\begin{cases}-\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2}-\frac{c\sqrt{-1+\frac{1}{c^2x^2}}}{2x} & \text{for}\ \frac{1}{|c^2x^2|}>1\\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2}-\frac{ic}{2x\sqrt{1-\frac{1}{c^2x^2}}}+\frac{i}{2cx^3\sqrt{1-\frac{1}{c^2x^2}}} & \text{otherwise}\end{cases}\right)}{3}+bce\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)-\frac{bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d/(3*x**3) - a*e/x + b*c*d*Piecewise((-c**2*acosh(1/(c*x))/2 - c*sqrt(-1
 + 1/(c**2*x**2))/(2*x), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I
*c/(2*x*sqrt(1 - 1/(c**2*x**2))) + I/(2*c*x**3*sqrt(1 - 1/(c**2*x**2))), Tr
ue))/3 + b*c*e*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1
```

```
/(c*x)), True)) - b*d*asin(c*x)/(3*x**3) - b*e*asin(c*x)/x
```

Giac [B] time = 13.4599, size = 581, normalized size = 6.84

$$-\frac{bc^6dx^3\arcsin(cx)}{24\left(\sqrt{-c^2x^2+1}+1\right)^3}-\frac{ac^6dx^3}{24\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{bc^5dx^2}{24\left(\sqrt{-c^2x^2+1}+1\right)^2}-\frac{bc^4dx\arcsin(cx)}{8\left(\sqrt{-c^2x^2+1}+1\right)}-\frac{ac^4dx}{8\left(\sqrt{-c^2x^2+1}+1\right)}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^6*d*x^3*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1)^3 - 1/24*a*c^6*d*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + 1/24*b*c^5*d*x^2/(sqrt(-c^2*x^2 + 1) + 1)^2 -
 1/8*b*c^4*d*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) - 1/8*a*c^4*d*x/(sqrt(-
c^2*x^2 + 1) + 1) + 1/6*b*c^3*d*log(abs(c)*abs(x)) - 1/6*b*c^3*d*log(sqrt(-
c^2*x^2 + 1) + 1) - 1/8*b*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x - 1/
2*b*c^2*x*arcsin(c*x)*e/(sqrt(-c^2*x^2 + 1) + 1) - 1/8*a*c^2*d*(sqrt(-c^2*x
^2 + 1) + 1)/x - 1/2*a*c^2*x*e/(sqrt(-c^2*x^2 + 1) + 1) + b*c*e*log(abs(c)*
abs(x)) - b*c*e*log(sqrt(-c^2*x^2 + 1) + 1) - 1/24*b*c*d*(sqrt(-c^2*x^2 + 1
) + 1)^2/x^2 - 1/24*b*d*(sqrt(-c^2*x^2 + 1) + 1)^3*arcsin(c*x)/x^3 - 1/2*b*
(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)*e/x - 1/24*a*d*(sqrt(-c^2*x^2 + 1) + 1
)^3/x^3 - 1/2*a*(sqrt(-c^2*x^2 + 1) + 1)*e/x
```

3.605 $\int x^4 \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=241

$$\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}(cx)\right)+\frac{b\left(1-c^2x^2\right)^{5/2}\left(21c^4d^2+90c^2de+70e^2\right)}{525c^9}$$

```
[Out] (b*(63*c^4*d^2 + 90*c^2*d*e + 35*e^2)*Sqrt[1 - c^2*x^2])/(315*c^9) - (2*b*(
63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (b*(21*
c^4*d^2 + 90*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (2*b*e*(9*c
^2*d + 14*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^2*(1 - c^2*x^2)^(9/2))/(
81*c^9) + (d^2*x^5*(a + b*ArcSin[c*x]))/5 + (2*d*e*x^7*(a + b*ArcSin[c*x]))
/7 + (e^2*x^9*(a + b*ArcSin[c*x]))/9
```

Rubi [A] time = 0.317549, antiderivative size = 241, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {270, 4731, 12, 1251, 897, 1153}

$$\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}(cx)\right)+\frac{b\left(1-c^2x^2\right)^{5/2}\left(21c^4d^2+90c^2de+70e^2\right)}{525c^9}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(63*c^4*d^2 + 90*c^2*d*e + 35*e^2)*Sqrt[1 - c^2*x^2])/(315*c^9) - (2*b*(
63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (b*(21*
c^4*d^2 + 90*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (2*b*e*(9*c
^2*d + 14*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^2*(1 - c^2*x^2)^(9/2))/(
81*c^9) + (d^2*x^5*(a + b*ArcSin[c*x]))/5 + (2*d*e*x^7*(a + b*ArcSin[c*x]))
/7 + (e^2*x^9*(a + b*ArcSin[c*x]))/9
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
```

```
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rubi steps

$$\int x^4\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}(cx)\right)-(bc$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}(cx)\right)-\frac{1}{315}$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}(cx)\right)-\frac{1}{630}$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}(cx)\right)+\frac{b\,S}{}$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}(cx)\right)+\frac{b\,S}{}$$

$$=\frac{b\left(63c^4d^2+90c^2de+35e^2\right)\sqrt{1-c^2x^2}}{315c^9}-\frac{2b\left(63c^4d^2+135c^2de+70e^2\right)\left(1-c^2x^2\right)^3}{945c^9}$$

Mathematica [A] time = 0.204813, size = 187, normalized size = 0.78

$$\frac{315ax^5\left(63d^2+90dex^2+35e^2x^4\right)+\frac{b\sqrt{1-c^2x^2}\left(c^8\left(3969d^2x^4+4050dex^6+1225e^2x^8\right)+4c^6\left(1323d^2x^2+1215dex^4+350e^2x^6\right)+24c^4\left(441d^2+270dex^2+70e^2\right.\right.}{c^9}}{99225}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x^5*(63*d^2 + 90*d*e*x^2 + 35*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(4480*
e^2 + 160*c^2*e*(81*d + 14*e*x^2) + 24*c^4*(441*d^2 + 270*d*e*x^2 + 70*e^2*
x^4) + 4*c^6*(1323*d^2*x^2 + 1215*d*e*x^4 + 350*e^2*x^6) + c^8*(3969*d^2*x^
4 + 4050*d*e*x^6 + 1225*e^2*x^8)))/c^9 + 315*b*x^5*(63*d^2 + 90*d*e*x^2 + 3
5*e^2*x^4)*ArcSin[c*x])/99225
```

Maple [A] time = 0.005, size = 339, normalized size = 1.4

$$\frac{1}{c^5}\left(\frac{a}{c^4}\left(\frac{e^2c^9x^9}{9}+\frac{2\,c^9edx^7}{7}+\frac{d^2c^9x^5}{5}\right)+\frac{b}{c^4}\left(\frac{\arcsin\left(cx\right)e^2c^9x^9}{9}+\frac{2\,\arcsin\left(cx\right)c^9edx^7}{7}+\frac{\arcsin\left(cx\right)d^2c^9x^5}{5}-\frac{e^2}{9}\left(-\frac{c^8}{9}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^5*(a/c^4*(1/9*e^2*c^9*x^9+2/7*c^9*e*d*x^7+1/5*d^2*c^9*x^5)+b/c^4*(1/9*a
rcsin(c*x)*e^2*c^9*x^9+2/7*arcsin(c*x)*c^9*e*d*x^7+1/5*arcsin(c*x)*d^2*c^9*
x^5-1/9*e^2*(-1/9*c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2
)-16/105*c^4*x^4*(-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/3
15*(-c^2*x^2+1)^(1/2))-2/7*c^2*e*d*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^
4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)
^(1/2))-1/5*d^2*c^4*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2
+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.47452, size = 424, normalized size = 1.76

$$\frac{1}{9}\,ae^2x^9+\frac{2}{7}\,adex^7+\frac{1}{5}\,ad^2x^5+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*e^2*x^9 + 2/7*a*d*e*x^7 + 1/5*a*d^2*x^5 + 1/75*(15*x^5*arcsin(c*x) +
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c)*b*d^2 + 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*
x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*
sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d*e + 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-
c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1
)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)
*b*e^2
```

Fricas [A] time = 2.08342, size = 540, normalized size = 2.24

$$\frac{11025\,ac^9e^2x^9+28350\,ac^9dex^7+19845\,ac^9d^2x^5+315\left(35\,bc^9e^2x^9+90\,bc^9dex^7+63\,bc^9d^2x^5\right)\arcsin\left(cx\right)+\left(1225\,bc^8\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*e^2*x^9 + 28350*a*c^9*d*e*x^7 + 19845*a*c^9*d^2*x^5 +
315*(35*b*c^9*e^2*x^9 + 90*b*c^9*d*e*x^7 + 63*b*c^9*d^2*x^5)*arcsin(c*x) +
(1225*b*c^8*e^2*x^8 + 10584*b*c^4*d^2 + 50*(81*b*c^8*d*e + 28*b*c^6*e^2)*x^
6 + 12960*b*c^2*d*e + 3*(1323*b*c^8*d^2 + 1620*b*c^6*d*e + 560*b*c^4*e^2)*x
^4 + 4480*b*e^2 + 4*(1323*b*c^6*d^2 + 1620*b*c^4*d*e + 560*b*c^2*e^2)*x^2)*
sqrt(-c^2*x^2 + 1))/c^9
```

Sympy [A] time = 23.9951, size = 415, normalized size = 1.72

$$\begin{cases} \frac{ad^2x^5}{5} + \frac{2adex^7}{7} + \frac{ae^2x^9}{9} + \frac{bd^2x^5\operatorname{asin}(cx)}{5} + \frac{2bdex^7\operatorname{asin}(cx)}{7} + \frac{be^2x^9\operatorname{asin}(cx)}{9} + \frac{bd^2x^4\sqrt{-c^2x^2+1}}{25c} + \frac{2bdex^6\sqrt{-c^2x^2+1}}{49c} + \frac{be^2x^8\sqrt{-c^2x^2+1}}{81c} + \frac{4bd^2x}{} \\ a\left(\frac{d^2x^5}{5} + \frac{2dex^7}{7} + \frac{e^2x^9}{9}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**5/5 + 2*a*d*e*x**7/7 + a*e**2*x**9/9 + b*d**2*x**5*asi
n(c*x)/5 + 2*b*d*e*x**7*asin(c*x)/7 + b*e**2*x**9*asin(c*x)/9 + b*d**2*x**4
*sqrt(-c**2*x**2 + 1)/(25*c) + 2*b*d*e*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b
*e**2*x**8*sqrt(-c**2*x**2 + 1)/(81*c) + 4*b*d**2*x**2*sqrt(-c**2*x**2 + 1)
/(75*c**3) + 12*b*d*e*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) + 8*b*e**2*x**6*
sqrt(-c**2*x**2 + 1)/(567*c**3) + 8*b*d**2*sqrt(-c**2*x**2 + 1)/(75*c**5) +
 16*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**2*x**4*sqrt(-c**2*
x**2 + 1)/(945*c**5) + 32*b*d*e*sqrt(-c**2*x**2 + 1)/(245*c**7) + 64*b*e**2
*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e**2*sqrt(-c**2*x**2 + 1)/(2
835*c**9), Ne(c, 0)), (a*(d**2*x**5/5 + 2*d*e*x**7/7 + e**2*x**9/9), True))
```

Giac [B] time = 1.26101, size = 805, normalized size = 3.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*x^9*e^2 + 2/7*a*d*x^7*e + 1/5*a*d^2*x^5 + 1/5*(c^2*x^2 - 1)^2*b*d^2*x
*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^4 + 2/7*(c^2*x^2
 - 1)^3*b*d*x*arcsin(c*x)*e/c^6 + 1/5*b*d^2*x*arcsin(c*x)/c^4 + 6/7*(c^2*x^
2 - 1)^2*b*d*x*arcsin(c*x)*e/c^6 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*
b*d^2/c^5 + 1/9*(c^2*x^2 - 1)^4*b*x*arcsin(c*x)*e^2/c^8 + 6/7*(c^2*x^2 - 1)
*b*d*x*arcsin(c*x)*e/c^6 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^5 + 2/49*(c^2*
x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e/c^7 + 4/9*(c^2*x^2 - 1)^3*b*x*arcsin(c*
x)*e^2/c^8 + 2/7*b*d*x*arcsin(c*x)*e/c^6 + 1/5*sqrt(-c^2*x^2 + 1)*b*d^2/c^5
 + 6/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e/c^7 + 2/3*(c^2*x^2 - 1)^2*
b*x*arcsin(c*x)*e^2/c^8 + 1/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^2/c^9
 - 2/7*(-c^2*x^2 + 1)^(3/2)*b*d*e/c^7 + 4/9*(c^2*x^2 - 1)*b*x*arcsin(c*x)*e
^2/c^8 + 4/63*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^2/c^9 + 2/7*sqrt(-c^2*
x^2 + 1)*b*d*e/c^7 + 1/9*b*x*arcsin(c*x)*e^2/c^8 + 2/15*(c^2*x^2 - 1)^2*sqr
t(-c^2*x^2 + 1)*b*e^2/c^9 - 4/27*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^9 + 1/9*sqrt(
-c^2*x^2 + 1)*b*e^2/c^9
```

3.606 $\int x^3 (d + ex^2)^2 (a + b\sin^{-1}(cx))\, dx$

Optimal. Leaf size=241

$$\frac{1}{4}d^2x^4\left(a + b\sin^{-1}(cx)\right) + \frac{1}{3}dex^6\left(a + b\sin^{-1}(cx)\right) + \frac{1}{8}e^2x^8\left(a + b\sin^{-1}(cx)\right) + \frac{bx^3\sqrt{1 - c^2x^2}\left(288c^4d^2 + 320c^2de + 10\right.}{4608c^5}$$

```
[Out] (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x*Sqrt[1 - c^2*x^2])/(3072*c^7) +
(b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x^3*Sqrt[1 - c^2*x^2])/(4608*c^5)
+ (b*e*(64*c^2*d + 21*e)*x^5*Sqrt[1 - c^2*x^2])/(1152*c^3) + (b*e^2*x^7*Sqr
t[1 - c^2*x^2])/(64*c) - (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*ArcSin[c*
x])/(3072*c^8) + (d^2*x^4*(a + b*ArcSin[c*x]))/4 + (d*e*x^6*(a + b*ArcSin[c
*x]))/3 + (e^2*x^8*(a + b*ArcSin[c*x]))/8
```

Rubi [A] time = 0.250571, antiderivative size = 241, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {266, 43, 4731, 12, 1267, 459, 321, 216}

$$\frac{1}{4}d^2x^4\left(a + b\sin^{-1}(cx)\right) + \frac{1}{3}dex^6\left(a + b\sin^{-1}(cx)\right) + \frac{1}{8}e^2x^8\left(a + b\sin^{-1}(cx)\right) + \frac{bx^3\sqrt{1 - c^2x^2}\left(288c^4d^2 + 320c^2de + 10\right.}{4608c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x*Sqrt[1 - c^2*x^2])/(3072*c^7) +
(b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x^3*Sqrt[1 - c^2*x^2])/(4608*c^5)
+ (b*e*(64*c^2*d + 21*e)*x^5*Sqrt[1 - c^2*x^2])/(1152*c^3) + (b*e^2*x^7*Sqr
t[1 - c^2*x^2])/(64*c) - (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*ArcSin[c*
x])/(3072*c^8) + (d^2*x^4*(a + b*ArcSin[c*x]))/4 + (d*e*x^6*(a + b*ArcSin[c
*x]))/3 + (e^2*x^8*(a + b*ArcSin[c*x]))/8
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1267

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[(c^p*(f*x)^(m + 4*p - 1)*(d + e*x^2)^
(q + 1))/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1)), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\sin^{-1}(cx)\right)-(bc$$

$$= \frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\sin^{-1}(cx)\right)-\frac{1}{24}$$

$$= \frac{be^2x^7\sqrt{1-c^2x^2}}{64c}+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+\right.$$

$$= \frac{be\left(64c^2d+21e\right)x^5\sqrt{1-c^2x^2}}{1152c^3}+\frac{be^2x^7\sqrt{1-c^2x^2}}{64c}+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de$$

$$= \frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x^3\sqrt{1-c^2x^2}}{4608c^5}+\frac{be\left(64c^2d+21e\right)x^5\sqrt{1-c^2x^2}}{1152c^3}+\frac{be}{}$$

$$= \frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x^3\sqrt{}}{4608c^5}$$

$$= \frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x^3\sqrt{}}{4608c^5}$$

Mathematica [A] time = 0.162572, size = 190, normalized size = 0.79

$$\frac{384ac^8x^4\left(6d^2+8dex^2+3e^2x^4\right)+bcx\sqrt{1-c^2x^2}\left(16c^6\left(36d^2x^2+32dex^4+9e^2x^6\right)+8c^4\left(108d^2+80dex^2+21e^2x^4\right)+\right.}{9216c^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (384*a*c^8*x^4*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4) + b*c*x*Sqrt[1 - c^2*x^2]*(3
15*e^2 + 30*c^2*e*(32*d + 7*e*x^2) + 8*c^4*(108*d^2 + 80*d*e*x^2 + 21*e^2*x
^4) + 16*c^6*(36*d^2*x^2 + 32*d*e*x^4 + 9*e^2*x^6)) + 3*b*(-288*c^4*d^2 - 3
20*c^2*d*e - 105*e^2 + 128*c^8*(6*d^2*x^4 + 8*d*e*x^6 + 3*e^2*x^8))*ArcSin[
c*x])/(9216*c^8)
```

Maple [A] time = 0.007, size = 303, normalized size = 1.3

$$\frac{1}{c^4}\left(\frac{a}{c^4}\left(\frac{e^2c^8x^8}{8}+\frac{c^8edx^6}{3}+\frac{x^4c^8d^2}{4}\right)+\frac{b}{c^4}\left(\frac{\arcsin(cx)\,e^2c^8x^8}{8}+\frac{\arcsin(cx)\,c^8edx^6}{3}+\frac{\arcsin(cx)\,d^2c^8x^4}{4}-\frac{e^2}{8}\left(-\frac{c^7x^7}{8}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^4*(a/c^4*(1/8*e^2*c^8*x^8+1/3*c^8*e*d*x^6+1/4*x^4*c^8*d^2)+b/c^4*(1/8*a
rcsin(c*x)*e^2*c^8*x^8+1/3*arcsin(c*x)*c^8*e*d*x^6+1/4*arcsin(c*x)*d^2*c^8*
x^4-1/8*e^2*(-1/8*c^7*x^7*(-c^2*x^2+1)^(1/2)-7/48*c^5*x^5*(-c^2*x^2+1)^(1/2
)-35/192*c^3*x^3*(-c^2*x^2+1)^(1/2)-35/128*c*x*(-c^2*x^2+1)^(1/2)+35/128*ar
csin(c*x))-1/3*c^2*e*d*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*
x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-1/4*d^2*c^4*(-1/
4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))))
```

Maxima [A] time = 1.47477, size = 432, normalized size = 1.79

$$\frac{1}{8}ae^2x^8+\frac{1}{3}adex^6+\frac{1}{4}ad^2x^4+\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^4}\right)c\right)bd^2+\frac{}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*e^2*x^8 + 1/3*a*d*e*x^6 + 1/4*a*d^2*x^4 + 1/32*(8*x^4*arcsin(c*x) + (
2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/
sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*d^2 + 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(
-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 +
1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*d*e + 1/3072*(3
84*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)
*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 1
05*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^8))*c)*b*e^2
```

Fricas [A] time = 2.14481, size = 517, normalized size = 2.15

$$\frac{1152\, ac^8e^2x^8 + 3072\, ac^8dex^6 + 2304\, ac^8d^2x^4 + 3\left(384\, bc^8e^2x^8 + 1024\, bc^8dex^6 + 768\, bc^8d^2x^4 - 288\, bc^4d^2 - 320\, bc^2de - 10\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9216*(1152*a*c^8*e^2*x^8 + 3072*a*c^8*d*e*x^6 + 2304*a*c^8*d^2*x^4 + 3*(3
84*b*c^8*e^2*x^8 + 1024*b*c^8*d*e*x^6 + 768*b*c^8*d^2*x^4 - 288*b*c^4*d^2 -
 320*b*c^2*d*e - 105*b*e^2)*arcsin(c*x) + (144*b*c^7*e^2*x^7 + 8*(64*b*c^7*
d*e + 21*b*c^5*e^2)*x^5 + 2*(288*b*c^7*d^2 + 320*b*c^5*d*e + 105*b*c^3*e^2)
*x^3 + 3*(288*b*c^5*d^2 + 320*b*c^3*d*e + 105*b*c*e^2)*x)*sqrt(-c^2*x^2 + 1
))/c^8
```

Sympy [A] time = 15.6783, size = 382, normalized size = 1.59

$$\begin{cases} \frac{ad^2x^4}{4} + \frac{adex^6}{3} + \frac{ae^2x^8}{8} + \frac{bd^2x^4\operatorname{asin}(cx)}{4} + \frac{bdex^6\operatorname{asin}(cx)}{3} + \frac{be^2x^8\operatorname{asin}(cx)}{8} + \frac{bd^2x^3\sqrt{-c^2x^2+1}}{16c} + \frac{bdex^5\sqrt{-c^2x^2+1}}{18c} + \frac{be^2x^7\sqrt{-c^2x^2+1}}{64c} + \frac{3bd^2x\sqrt{-\cdots}}{32c\cdots} \\ a\left(\frac{d^2x^4}{4} + \frac{dex^6}{3} + \frac{e^2x^8}{8}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**4/4 + a*d*e*x**6/3 + a*e**2*x**8/8 + b*d**2*x**4*asin(
c*x)/4 + b*d*e*x**6*asin(c*x)/3 + b*e**2*x**8*asin(c*x)/8 + b*d**2*x**3*sqr
t(-c**2*x**2 + 1)/(16*c) + b*d*e*x**5*sqrt(-c**2*x**2 + 1)/(18*c) + b*e**2*
x**7*sqrt(-c**2*x**2 + 1)/(64*c) + 3*b*d**2*x*sqrt(-c**2*x**2 + 1)/(32*c**3
) + 5*b*d*e*x**3*sqrt(-c**2*x**2 + 1)/(72*c**3) + 7*b*e**2*x**5*sqrt(-c**2*
x**2 + 1)/(384*c**3) - 3*b*d**2*asin(c*x)/(32*c**4) + 5*b*d*e*x*sqrt(-c**2*
x**2 + 1)/(48*c**5) + 35*b*e**2*x**3*sqrt(-c**2*x**2 + 1)/(1536*c**5) - 5*b
*d*e*asin(c*x)/(48*c**6) + 35*b*e**2*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) - 3
5*b*e**2*asin(c*x)/(1024*c**8), Ne(c, 0)), (a*(d**2*x**4/4 + d*e*x**6/3 + e
**2*x**8/8), True))
```

Giac [B] time = 1.25017, size = 861, normalized size = 3.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/16*(-c^2*x^2 + 1)^(3/2)*b*d^2*x/c^3 + 1/4*(c^2*x^2 - 1)^2*b*d^2*arcsin(c
*x)/c^4 + 5/32*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 1/18*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b*d*x*e/c^5 + 1/4*(c^2*x^2 - 1)^2*a*d^2/c^4 + 1/2*(c^2*x^2 - 1
)*b*d^2*arcsin(c*x)/c^4 + 1/3*(c^2*x^2 - 1)^3*b*d*arcsin(c*x)*e/c^6 - 13/72
*(-c^2*x^2 + 1)^(3/2)*b*d*x*e/c^5 + 1/2*(c^2*x^2 - 1)*a*d^2/c^4 + 5/32*b*d^
2*arcsin(c*x)/c^4 + 1/3*(c^2*x^2 - 1)^3*a*d*e/c^6 + (c^2*x^2 - 1)^2*b*d*arc
sin(c*x)*e/c^6 + 1/64*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*x*e^2/c^7 + 11/4
8*sqrt(-c^2*x^2 + 1)*b*d*x*e/c^5 + 1/8*(c^2*x^2 - 1)^4*b*arcsin(c*x)*e^2/c^
8 + (c^2*x^2 - 1)^2*a*d*e/c^6 + (c^2*x^2 - 1)*b*d*arcsin(c*x)*e/c^6 + 25/38
```

```
4*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*x*e^2/c^7 + 1/8*(c^2*x^2 - 1)^4*a*e^
2/c^8 + 1/2*(c^2*x^2 - 1)^3*b*arcsin(c*x)*e^2/c^8 + (c^2*x^2 - 1)*a*d*e/c^6
 + 11/48*b*d*arcsin(c*x)*e/c^6 - 163/1536*(-c^2*x^2 + 1)^(3/2)*b*x*e^2/c^7
+ 1/2*(c^2*x^2 - 1)^3*a*e^2/c^8 + 3/4*(c^2*x^2 - 1)^2*b*arcsin(c*x)*e^2/c^8
 + 93/1024*sqrt(-c^2*x^2 + 1)*b*x*e^2/c^7 + 3/4*(c^2*x^2 - 1)^2*a*e^2/c^8 +
 1/2*(c^2*x^2 - 1)*b*arcsin(c*x)*e^2/c^8 + 1/2*(c^2*x^2 - 1)*a*e^2/c^8 + 93
/1024*b*arcsin(c*x)*e^2/c^8
```

3.607 $\int x^2 \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=198

$$\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin^{-1}(cx)\right)-\frac{b\left(1-c^2x^2\right)^{3/2}\left(35c^4d^2+84c^2de+45e^2\right)}{315c^7}+$$

```
[Out] (b*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*Sqrt[1 - c^2*x^2])/(105*c^7) - (b*(35
*c^4*d^2 + 84*c^2*d*e + 45*e^2)*(1 - c^2*x^2)^(3/2))/(315*c^7) + (b*e*(14*c
^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^2*(1 - c^2*x^2)^(7/2))/(
49*c^7) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 + (2*d*e*x^5*(a + b*ArcSin[c*x]))
/5 + (e^2*x^7*(a + b*ArcSin[c*x]))/7
```

Rubi [A] time = 0.221466, antiderivative size = 198, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {270, 4731, 12, 1251, 771}

$$\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin^{-1}(cx)\right)-\frac{b\left(1-c^2x^2\right)^{3/2}\left(35c^4d^2+84c^2de+45e^2\right)}{315c^7}+$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*Sqrt[1 - c^2*x^2])/(105*c^7) - (b*(35
*c^4*d^2 + 84*c^2*d*e + 45*e^2)*(1 - c^2*x^2)^(3/2))/(315*c^7) + (b*e*(14*c
^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^2*(1 - c^2*x^2)^(7/2))/(
49*c^7) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 + (2*d*e*x^5*(a + b*ArcSin[c*x]))
/5 + (e^2*x^7*(a + b*ArcSin[c*x]))/7
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 771

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (
c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && NeQ[b^
2 - 4*a*c, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0] && IntegerQ[m]))
```

Rubi steps

$$\int x^2\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)dx=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin^{-1}(cx)\right)-$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin^{-1}(cx)\right)-$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin^{-1}(cx)\right)-$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin^{-1}(cx)\right)-$$

$$=\frac{b\left(35c^4d^2+42c^2de+15e^2\right)\sqrt{1-c^2x^2}}{105c^7}-\frac{b\left(35c^4d^2+84c^2de+45e^2\right)\left(1-c^2x^2\right)}{315c^7}$$

Mathematica [A] time = 0.184045, size = 158, normalized size = 0.8

$$\frac{105ax^3\left(35d^2+42dex^2+15e^2x^4\right)+\frac{b\sqrt{1-c^2x^2}\left(c^6\left(1225d^2x^2+882dex^4+225e^2x^6\right)+2c^4\left(1225d^2+588dex^2+135e^2x^4\right)+24c^2e\left(98d+15ex^2\right)+720e^2\right)}{c^7}+}{11025}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (105*a*x^3*(35*d^2 + 42*d*e*x^2 + 15*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(720*e
^2 + 24*c^2*e*(98*d + 15*e*x^2) + 2*c^4*(1225*d^2 + 588*d*e*x^2 + 135*e^2*x
^4) + c^6*(1225*d^2*x^2 + 882*d*e*x^4 + 225*e^2*x^6)))/c^7 + 105*b*x^3*(35*
d^2 + 42*d*e*x^2 + 15*e^2*x^4)*ArcSin[c*x])/11025
```

Maple [A] time = 0.004, size = 279, normalized size = 1.4

$$\frac{1}{c^3}\left(\frac{a}{c^4}\left(\frac{e^2c^7x^7}{7}+\frac{2c^7edx^5}{5}+\frac{d^2c^7x^3}{3}\right)+\frac{b}{c^4}\left(\frac{\arcsin(cx)e^2c^7x^7}{7}+\frac{2\arcsin(cx)c^7edx^5}{5}+\frac{\arcsin(cx)d^2c^7x^3}{3}-\frac{e^2}{7}\left(-\frac{c^6}{7}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^3*(a/c^4*(1/7*e^2*c^7*x^7+2/5*c^7*e*d*x^5+1/3*d^2*c^7*x^3)+b/c^4*(1/7*a
rcsin(c*x)*e^2*c^7*x^7+2/5*arcsin(c*x)*c^7*e*d*x^5+1/3*arcsin(c*x)*d^2*c^7*
x^3-1/7*e^2*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2
)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-2/5*c^2*e*d*(-1
/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^
2+1)^(1/2))-1/3*d^2*c^4*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(
1/2))))
```

Maxima [A] time = 1.46714, size = 342, normalized size = 1.73

$$\frac{1}{7}ae^2x^7 + \frac{2}{5}adex^5 + \frac{1}{3}ad^2x^3 + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2 + \frac{2}{75}\left(15x^5\arcsin(cx) + \left(\frac{3}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e^2*x^7 + 2/5*a*d*e*x^5 + 1/3*a*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2 + 2/75*(15*x
^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c
^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e + 1/245*(35*x^7*arcsin(c*x) + (5*sq
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*e^2
```

Fricas [A] time = 2.04131, size = 450, normalized size = 2.27

$$\frac{1575\,ac^7e^2x^7 + 4410\,ac^7dex^5 + 3675\,ac^7d^2x^3 + 105\left(15\,bc^7e^2x^7 + 42\,bc^7dex^5 + 35\,bc^7d^2x^3\right)\arcsin(cx) + \left(225\,bc^6e^2x^6 + 2\right.}{11025}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*(1575*a*c^7*e^2*x^7 + 4410*a*c^7*d*e*x^5 + 3675*a*c^7*d^2*x^3 + 105
*(15*b*c^7*e^2*x^7 + 42*b*c^7*d*e*x^5 + 35*b*c^7*d^2*x^3)*arcsin(c*x) + (22
5*b*c^6*e^2*x^6 + 2450*b*c^4*d^2 + 2352*b*c^2*d*e + 18*(49*b*c^6*d*e + 15*b
*c^4*e^2)*x^4 + 720*b*e^2 + (1225*b*c^6*d^2 + 1176*b*c^4*d*e + 360*b*c^2*e^
2)*x^2)*sqrt(-c^2*x^2 + 1))/c^7
```

Sympy [A] time = 8.28768, size = 333, normalized size = 1.68

$$\begin{cases} \frac{ad^2x^3}{3} + \frac{2adex^5}{5} + \frac{ae^2x^7}{7} + \frac{bd^2x^3\operatorname{asin}(cx)}{3} + \frac{2bdex^5\operatorname{asin}(cx)}{5} + \frac{be^2x^7\operatorname{asin}(cx)}{7} + \frac{bd^2x^2\sqrt{-c^2x^2+1}}{9c} + \frac{2bdex^4\sqrt{-c^2x^2+1}}{25c} + \frac{be^2x^6\sqrt{-c^2x^2+1}}{49c} + \frac{2bd^2\sqrt{}}{} \\ a\left(\frac{d^2x^3}{3} + \frac{2dex^5}{5} + \frac{e^2x^7}{7}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**3/3 + 2*a*d*e*x**5/5 + a*e**2*x**7/7 + b*d**2*x**3*asi
n(c*x)/3 + 2*b*d*e*x**5*asin(c*x)/5 + b*e**2*x**7*asin(c*x)/7 + b*d**2*x**2
*sqrt(-c**2*x**2 + 1)/(9*c) + 2*b*d*e*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*
e**2*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + 2*b*d**2*sqrt(-c**2*x**2 + 1)/(9*c*
*3) + 8*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 6*b*e**2*x**4*sqrt(-c**
2*x**2 + 1)/(245*c**3) + 16*b*d*e*sqrt(-c**2*x**2 + 1)/(75*c**5) + 8*b*e**2
*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**2*sqrt(-c**2*x**2 + 1)/(245
*c**7), Ne(c, 0)), (a*(d**2*x**3/3 + 2*d*e*x**5/5 + e**2*x**7/7), True))
```

Giac [B] time = 1.26082, size = 576, normalized size = 2.91

$$\frac{1}{7}ax^7e^2 + \frac{2}{5}adx^5e + \frac{1}{3}ad^2x^3 + \frac{\left(c^2x^2-1\right)bd^2x\arcsin\left(cx\right)}{3c^2} + \frac{bd^2x\arcsin\left(cx\right)}{3c^2} + \frac{2\left(c^2x^2-1\right)^2bdx\arcsin\left(cx\right)e}{5c^4} + \frac{4\left(c^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*x^7*e^2 + 2/5*a*d*x^5*e + 1/3*a*d^2*x^3 + 1/3*(c^2*x^2 - 1)*b*d^2*x*a
rcsin(c*x)/c^2 + 1/3*b*d^2*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*b*d*x*ar
csin(c*x)*e/c^4 + 4/5*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)*e/c^4 - 1/9*(-c^2*x^2
 + 1)^(3/2)*b*d^2/c^3 + 1/7*(c^2*x^2 - 1)^3*b*x*arcsin(c*x)*e^2/c^6 + 2/5*b
*d*x*arcsin(c*x)*e/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*d^2/c^3 + 2/25*(c^2*x^2 -
 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e/c^5 + 3/7*(c^2*x^2 - 1)^2*b*x*arcsin(c*x)*e^
2/c^6 - 4/15*(-c^2*x^2 + 1)^(3/2)*b*d*e/c^5 + 3/7*(c^2*x^2 - 1)*b*x*arcsin(
c*x)*e^2/c^6 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^2/c^7 + 2/5*sqrt
(-c^2*x^2 + 1)*b*d*e/c^5 + 1/7*b*x*arcsin(c*x)*e^2/c^6 + 3/35*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b*e^2/c^7 - 1/7*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^7 + 1/7*
sqrt(-c^2*x^2 + 1)*b*e^2/c^7
```

3.608 $\int x\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=183

$$\frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6e}+\frac{bx\sqrt{1-c^2x^2}\left(44c^4d^2+44c^2de+15e^2\right)}{288c^5}-\frac{b\left(2c^2d+e\right)\left(8c^4d^2+8c^2de+5e^2\right)\sin^{-1}(cx)}{96c^6e}+\cdots$$

```
[Out] (b*(44*c^4*d^2 + 44*c^2*d*e + 15*e^2)*x*Sqrt[1 - c^2*x^2])/(288*c^5) + (5*b
*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(144*c^3) + (b*x*Sqrt[1 - c
^2*x^2]*(d + e*x^2)^2)/(36*c) - (b*(2*c^2*d + e)*(8*c^4*d^2 + 8*c^2*d*e + 5
*e^2)*ArcSin[c*x])/(96*c^6*e) + ((d + e*x^2)^3*(a + b*ArcSin[c*x]))/(6*e)
```

Rubi [A] time = 0.175834, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4729, 416, 528, 388, 216}

$$\frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6e}+\frac{bx\sqrt{1-c^2x^2}\left(44c^4d^2+44c^2de+15e^2\right)}{288c^5}-\frac{b\left(2c^2d+e\right)\left(8c^4d^2+8c^2de+5e^2\right)\sin^{-1}(cx)}{96c^6e}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(44*c^4*d^2 + 44*c^2*d*e + 15*e^2)*x*Sqrt[1 - c^2*x^2])/(288*c^5) + (5*b
*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(144*c^3) + (b*x*Sqrt[1 - c
^2*x^2]*(d + e*x^2)^2)/(36*c) - (b*(2*c^2*d + e)*(8*c^4*d^2 + 8*c^2*d*e + 5
*e^2)*ArcSin[c*x])/(96*c^6*e) + ((d + e*x^2)^3*(a + b*ArcSin[c*x]))/(6*e)
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 416

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(d*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1))/(b*(n*(p + q) + 1)),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)dx=\frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^3}{\sqrt{1-c^2x^2}}dx}{6e}$$
$$=\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{36c}+\frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6e}+\frac{b\int\frac{\left(d+ex^2\right)\left(-d\left(6c^2d+e\right)-5e\right.}{\sqrt{1-c^2x^2}}}{36ce}$$
$$=\frac{5b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{36c}+\frac{\left(d+ex^2\right)^3\left(a+\right.}{6e}$$
$$=\frac{b\left(44c^4d^2+44c^2de+15e^2\right)x\sqrt{1-c^2x^2}}{288c^5}+\frac{5b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{144c^3}+$$
$$=\frac{b\left(44c^4d^2+44c^2de+15e^2\right)x\sqrt{1-c^2x^2}}{288c^5}+\frac{5b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{144c^3}+$$

Mathematica [A] time = 0.14344, size = 159, normalized size = 0.87

$$\frac{cx\left(48ac^5x\left(3d^2+3dex^2+e^2x^4\right)+b\sqrt{1-c^2x^2}\left(4c^4\left(18d^2+9dex^2+2e^2x^4\right)+2c^2e\left(27d+5ex^2\right)+15e^2\right)\right)+3b\sin^{-1}(c}{288c^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(48*a*c^5*x*(3*d^2 + 3*d*e*x^2 + e^2*x^4) + b*Sqrt[1 - c^2*x^2]*(15*e^
2 + 2*c^2*e*(27*d + 5*e*x^2) + 4*c^4*(18*d^2 + 9*d*e*x^2 + 2*e^2*x^4))) + 3
*b*(-24*c^4*d^2 - 18*c^2*d*e - 5*e^2 + 16*c^6*(3*d^2*x^2 + 3*d*e*x^4 + e^2*
x^6))*ArcSin[c*x])/(288*c^6)
```

Maple [A] time = 0.004, size = 243, normalized size = 1.3

$$\frac{1}{c^2}\left(\frac{a}{c^4}\left(\frac{e^2c^6x^6}{6}+\frac{c^6edx^4}{2}+\frac{x^2c^6d^2}{2}\right)+\frac{b}{c^4}\left(\frac{\arcsin(cx)e^2c^6x^6}{6}+\frac{\arcsin(cx)c^6edx^4}{2}+\frac{\arcsin(cx)d^2c^6x^2}{2}-\frac{e^2}{6}\left(-\frac{c^5x^5}{6}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^2*(a/c^4*(1/6*e^2*c^6*x^6+1/2*c^6*e*d*x^4+1/2*x^2*c^6*d^2)+b/c^4*(1/6*a
rcsin(c*x)*e^2*c^6*x^6+1/2*arcsin(c*x)*c^6*e*d*x^4+1/2*arcsin(c*x)*d^2*c^6*
x^2-1/6*e^2*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2
```

```
)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-1/2*c^2*e*d*(-1/4*c^3*x^3*(
-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-1/2*d^2*c^4*(
-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

Maxima [A] time = 1.46077, size = 350, normalized size = 1.91

$$\frac{1}{6}\,ae^2x^6 + \frac{1}{2}\,adex^4 + \frac{1}{2}\,ad^2x^2 + \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^2}\right)\right)bd^2 + \frac{1}{16}\left(8\,x^4\arcsin\left(cx\right) + \left(\frac{2\,\sqrt{-}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*e^2*x^6 + 1/2*a*d*e*x^4 + 1/2*a*d^2*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^2))*b*d^2
 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^
2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*d*e + 1/288*
(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)
*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c
^2)*c^6))*c)*b*e^2
```

Fricas [A] time = 2.11304, size = 414, normalized size = 2.26

$$\frac{48\,ac^6e^2x^6 + 144\,ac^6dex^4 + 144\,ac^6d^2x^2 + 3\left(16\,bc^6e^2x^6 + 48\,bc^6dex^4 + 48\,bc^6d^2x^2 - 24\,bc^4d^2 - 18\,bc^2de - 5\,be^2\right)\arcsin\left(c\right.}{288\,c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*e^2*x^6 + 144*a*c^6*d*e*x^4 + 144*a*c^6*d^2*x^2 + 3*(16*b*c
^6*e^2*x^6 + 48*b*c^6*d*e*x^4 + 48*b*c^6*d^2*x^2 - 24*b*c^4*d^2 - 18*b*c^2*
d*e - 5*b*e^2)*arcsin(c*x) + (8*b*c^5*e^2*x^5 + 2*(18*b*c^5*d*e + 5*b*c^3*e
^2)*x^3 + 3*(24*b*c^5*d^2 + 18*b*c^3*d*e + 5*b*c*e^2)*x)*sqrt(-c^2*x^2 + 1)
)/c^6
```

Sympy [A] time = 5.86242, size = 299, normalized size = 1.63

$$\begin{cases} \frac{ad^2x^2}{2} + \frac{adex^4}{2} + \frac{ae^2x^6}{6} + \frac{bd^2x^2\operatorname{asin}(cx)}{2} + \frac{bdex^4\operatorname{asin}(cx)}{2} + \frac{be^2x^6\operatorname{asin}(cx)}{6} + \frac{bd^2x\sqrt{-c^2x^2+1}}{4c} + \frac{bdex^3\sqrt{-c^2x^2+1}}{8c} + \frac{be^2x^5\sqrt{-c^2x^2+1}}{36c} - \frac{bd^2\operatorname{asin}(c}{4c^2} \\ a\left(\frac{d^2x^2}{2} + \frac{dex^4}{2} + \frac{e^2x^6}{6}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**2/2 + a*d*e*x**4/2 + a*e**2*x**6/6 + b*d**2*x**2*asin(
c*x)/2 + b*d*e*x**4*asin(c*x)/2 + b*e**2*x**6*asin(c*x)/6 + b*d**2*x*sqrt(-
c**2*x**2 + 1)/(4*c) + b*d*e*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + b*e**2*x**5*
sqrt(-c**2*x**2 + 1)/(36*c) - b*d**2*asin(c*x)/(4*c**2) + 3*b*d*e*x*sqrt(-c
```

```
**2*x**2 + 1)/(16*c**3) + 5*b*e**2*x**3*sqrt(-c**2*x**2 + 1)/(144*c**3) - 3
*b*d*e*asin(c*x)/(16*c**4) + 5*b*e**2*x*sqrt(-c**2*x**2 + 1)/(96*c**5) - 5*
b*e**2*asin(c*x)/(96*c**6), Ne(c, 0)), (a*(d**2*x**2/2 + d*e*x**4/2 + e**2*
x**6/6), True))
```

Giac [B] time = 1.35075, size = 571, normalized size = 3.12

$$\frac{\sqrt{-c^2x^2+1}bd^2x}{4c} + \frac{\left(c^2x^2-1\right)bd^2\arcsin\left(cx\right)}{2c^2} - \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bdxe}{8c^3} + \frac{\left(c^2x^2-1\right)ad^2}{2c^2} + \frac{bd^2\arcsin\left(cx\right)}{4c^2} + \frac{\left(c^2x^2-1\right)^2bd}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*x/c + 1/2*(c^2*x^2 - 1)*b*d^2*arcsin(c*x)/c^2
- 1/8*(-c^2*x^2 + 1)^(3/2)*b*d*x*e/c^3 + 1/2*(c^2*x^2 - 1)*a*d^2/c^2 + 1/4*
b*d^2*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)^2*b*d*arcsin(c*x)*e/c^4 + 5/16*sq
rt(-c^2*x^2 + 1)*b*d*x*e/c^3 + 1/2*(c^2*x^2 - 1)^2*a*d*e/c^4 + (c^2*x^2 - 1
)*b*d*arcsin(c*x)*e/c^4 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*x*e^2/c
^5 + 1/6*(c^2*x^2 - 1)^3*b*arcsin(c*x)*e^2/c^6 + (c^2*x^2 - 1)*a*d*e/c^4 +
5/16*b*d*arcsin(c*x)*e/c^4 - 13/144*(-c^2*x^2 + 1)^(3/2)*b*x*e^2/c^5 + 1/6*
(c^2*x^2 - 1)^3*a*e^2/c^6 + 1/2*(c^2*x^2 - 1)^2*b*arcsin(c*x)*e^2/c^6 + 11/
96*sqrt(-c^2*x^2 + 1)*b*x*e^2/c^5 + 1/2*(c^2*x^2 - 1)^2*a*e^2/c^6 + 1/2*(c^
2*x^2 - 1)*b*arcsin(c*x)*e^2/c^6 + 1/2*(c^2*x^2 - 1)*a*e^2/c^6 + 11/96*b*ar
csin(c*x)*e^2/c^6
```

3.609 $\int \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=150

$$d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{b\sqrt{1-c^2x^2}\left(15c^4d^2+10c^2de+3e^2\right)}{15c^5}-\frac{2be\left(1\right.}{}$$

```
[Out] (b*(15*c^4*d^2 + 10*c^2*d*e + 3*e^2)*Sqrt[1 - c^2*x^2])/(15*c^5) - (2*b*e*(
5*c^2*d + 3*e)*(1 - c^2*x^2)^(3/2))/(45*c^5) + (b*e^2*(1 - c^2*x^2)^(5/2))/
(25*c^5) + d^2*x*(a + b*ArcSin[c*x]) + (2*d*e*x^3*(a + b*ArcSin[c*x]))/3 +
(e^2*x^5*(a + b*ArcSin[c*x]))/5
```

Rubi [A] time = 0.136157, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {194, 4665, 12, 1247, 698}

$$d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{b\sqrt{1-c^2x^2}\left(15c^4d^2+10c^2de+3e^2\right)}{15c^5}-\frac{2be\left(1\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*(15*c^4*d^2 + 10*c^2*d*e + 3*e^2)*Sqrt[1 - c^2*x^2])/(15*c^5) - (2*b*e*(
5*c^2*d + 3*e)*(1 - c^2*x^2)^(3/2))/(45*c^5) + (b*e^2*(1 - c^2*x^2)^(5/2))/
(25*c^5) + d^2*x*(a + b*ArcSin[c*x]) + (2*d*e*x^3*(a + b*ArcSin[c*x]))/3 +
(e^2*x^5*(a + b*ArcSin[c*x]))/5
```


Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4665

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
```

```
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx = d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(cx)\right)-(bc)$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{15}(bc$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bc$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bc$$

$$= \frac{b\left(15c^4d^2+10c^2de+3e^2\right)\sqrt{1-c^2x^2}}{15c^5}-\frac{2be\left(5c^2d+3e\right)\left(1-c^2x^2\right)^{3/2}}{45c^5}+\frac{be^2\left(1-c^2\right.}{25c^5}$$

Mathematica [A] time = 0.151411, size = 125, normalized size = 0.83

$$\frac{1}{225}\left(15ax\left(15d^2+10dex^2+3e^2x^4\right)+\frac{b\sqrt{1-c^2x^2}\left(c^4\left(225d^2+50dex^2+9e^2x^4\right)+4c^2e\left(25d+3ex^2\right)+24e^2\right)}{c^5}+15bx\,\text{si}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*a*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(24*e^2 +
4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*d*e*x^2 + 9*e^2*x^4)))/c^5 + 1
5*b*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4)*ArcSin[c*x])/225
```

Maple [A] time = 0.006, size = 209, normalized size = 1.4

$$\frac{1}{c}\left(\frac{a}{c^4}\left(\frac{e^2c^5x^5}{5}+\frac{2\,c^5edx^3}{3}+d^2c^5x\right)+\frac{b}{c^4}\left(\frac{\arcsin(cx)\,e^2c^5x^5}{5}+\frac{2\,\arcsin(cx)\,c^5edx^3}{3}+\arcsin(cx)\,d^2c^5x-\frac{e^2}{5}\left(-\frac{c^4x^4}{5}\sqrt{\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(a/c^4*(1/5*e^2*c^5*x^5+2/3*c^5*e*d*x^3+d^2*c^5*x)+b/c^4*(1/5*arcsin(c*
x)*e^2*c^5*x^5+2/3*arcsin(c*x)*c^5*e*d*x^3+arcsin(c*x)*d^2*c^5*x-1/5*e^2*(-
1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x
^2+1)^(1/2))-2/3*c^2*e*d*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^
(1/2))+d^2*c^4*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.45678, size = 246, normalized size = 1.64

$$\frac{1}{5}ae^2x^5+\frac{2}{3}adex^3+\frac{2}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde+\frac{1}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2}}{c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e^2*x^5 + 2/3*a*d*e*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e + 1/75*(15*x^5*arcsin(c*x) +
 (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2
*x^2 + 1)/c^6)*c)*b*e^2 + a*d^2*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*
b*d^2/c
```

Fricas [A] time = 2.0348, size = 348, normalized size = 2.32

$$\frac{45\,ac^5e^2x^5+150\,ac^5dex^3+225\,ac^5d^2x+15\left(3\,bc^5e^2x^5+10\,bc^5dex^3+15\,bc^5d^2x\right)\arcsin\left(cx\right)+\left(9\,bc^4e^2x^4+225\,bc^4d^2+1\right.}{225\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*e^2*x^5 + 150*a*c^5*d*e*x^3 + 225*a*c^5*d^2*x + 15*(3*b*c^5
*e^2*x^5 + 10*b*c^5*d*e*x^3 + 15*b*c^5*d^2*x)*arcsin(c*x) + (9*b*c^4*e^2*x^
4 + 225*b*c^4*d^2 + 100*b*c^2*d*e + 24*b*e^2 + 2*(25*b*c^4*d*e + 6*b*c^2*e^
2)*x^2)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 2.85913, size = 240, normalized size = 1.6

$$\begin{cases} ad^2x+\frac{2adex^3}{3}+\frac{ae^2x^5}{5}+bd^2x\,\mathrm{asin}\,(cx)+\frac{2bdex^3\,\mathrm{asin}\,(cx)}{3}+\frac{be^2x^5\,\mathrm{asin}\,(cx)}{5}+\frac{bd^2\sqrt{-c^2x^2+1}}{c}+\frac{2bdex^2\sqrt{-c^2x^2+1}}{9c}+\frac{be^2x^4\sqrt{-c^2x^2+1}}{25c}+\frac{4bde\cdots}{} \\ a\left(d^2x+\frac{2dex^3}{3}+\frac{e^2x^5}{5}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x + 2*a*d*e*x**3/3 + a*e**2*x**5/5 + b*d**2*x*asin(c*x) +
 2*b*d*e*x**3*asin(c*x)/3 + b*e**2*x**5*asin(c*x)/5 + b*d**2*sqrt(-c**2*x**
2 + 1)/c + 2*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*x**4*sqrt(-c**2
*x**2 + 1)/(25*c) + 4*b*d*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*e**2*x**2*s
qrt(-c**2*x**2 + 1)/(75*c**3) + 8*b*e**2*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne
(c, 0)), (a*(d**2*x + 2*d*e*x**3/3 + e**2*x**5/5), True))
```

Giac [A] time = 1.24982, size = 355, normalized size = 2.37

$$\frac{1}{5}\,ax^5e^2+\frac{2}{3}\,adx^3e+bd^2x\arcsin\left(cx\right)+ad^2x+\frac{2\left(c^2x^2-1\right)bdx\arcsin\left(cx\right)e}{3\,c^2}+\frac{2\,bdx\arcsin\left(cx\right)e}{3\,c^2}+\frac{\sqrt{-c^2x^2+1}bd^2}{c}+\frac{(c\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*x^5*e^2 + 2/3*a*d*x^3*e + b*d^2*x*arcsin(c*x) + a*d^2*x + 2/3*(c^2*x^
2 - 1)*b*d*x*arcsin(c*x)*e/c^2 + 2/3*b*d*x*arcsin(c*x)*e/c^2 + sqrt(-c^2*x^
2 + 1)*b*d^2/c + 1/5*(c^2*x^2 - 1)^2*b*x*arcsin(c*x)*e^2/c^4 - 2/9*(-c^2*x^
2 + 1)^(3/2)*b*d*e/c^3 + 2/5*(c^2*x^2 - 1)*b*x*arcsin(c*x)*e^2/c^4 + 2/3*sq
rt(-c^2*x^2 + 1)*b*d*e/c^3 + 1/5*b*x*arcsin(c*x)*e^2/c^4 + 1/25*(c^2*x^2 -
1)^2*sqrt(-c^2*x^2 + 1)*b*e^2/c^5 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^5 + 1
/5*sqrt(-c^2*x^2 + 1)*b*e^2/c^5
```

3.610 $\int \frac{(d+ex^2)^2(a+b\sin^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=229

$$-\frac{1}{2}ibd^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+d^2\log(x)\left(a+b\sin^{-1}(cx)\right)+dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{bdex\sqrt{1}}{2}$$

```
[Out] (b*d*e*x*Sqrt[1 - c^2*x^2])/(2*c) + (3*b*e^2*x*Sqrt[1 - c^2*x^2])/(32*c^3)
+ (b*e^2*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (b*d*e*ArcSin[c*x])/(2*c^2) - (3*b
*e^2*ArcSin[c*x])/(32*c^4) - (I/2)*b*d^2*ArcSin[c*x]^2 + d*e*x^2*(a + b*Arc
Sin[c*x]) + (e^2*x^4*(a + b*ArcSin[c*x]))/4 + b*d^2*ArcSin[c*x]*Log[1 - E^(
(2*I)*ArcSin[c*x])] - b*d^2*ArcSin[c*x]*Log[x] + d^2*(a + b*ArcSin[c*x])*Lo
g[x] - (I/2)*b*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.334752, antiderivative size = 229, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {266, 43, 4731, 6742, 321, 216, 2326, 4625, 3717, 2190, 2279, 2391}

$$-\frac{1}{2}ibd^2\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+d^2\log(x)\left(a+b\sin^{-1}(cx)\right)+dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{bdex\sqrt{1}}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```


```
[Out] (b*d*e*x*Sqrt[1 - c^2*x^2])/(2*c) + (3*b*e^2*x*Sqrt[1 - c^2*x^2])/(32*c^3)
+ (b*e^2*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (b*d*e*ArcSin[c*x])/(2*c^2) - (3*b
*e^2*ArcSin[c*x])/(32*c^4) - (I/2)*b*d^2*ArcSin[c*x]^2 + d*e*x^2*(a + b*Arc
Sin[c*x]) + (e^2*x^4*(a + b*ArcSin[c*x]))/4 + b*d^2*ArcSin[c*x]*Log[1 - E^(
(2*I)*ArcSin[c*x])] - b*d^2*ArcSin[c*x]*Log[x] + d^2*(a + b*ArcSin[c*x])*Lo
g[x] - (I/2)*b*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+d^2\left(a+b\sin^{-1}(cx)\right)\log(x)-(bc)$$

$$= dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+d^2\left(a+b\sin^{-1}(cx)\right)\log(x)-(bc)$$

$$= dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+d^2\left(a+b\sin^{-1}(cx)\right)\log(x)-\left(bcd\right.$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}+dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx)}{2c^2}+dex^2\left(a+b\sin\right.$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx)}{2c^2}-\frac{3be^2\sin^{-1}(c}{32c^4}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx)}{2c^2}-\frac{3be^2\sin^{-1}(c}{32c^4}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx)}{2c^2}-\frac{3be^2\sin^{-1}(c}{32c^4}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx)}{2c^2}-\frac{3be^2\sin^{-1}(c}{32c^4}$$

Mathematica [A] time = 0.465204, size = 184, normalized size = 0.8

$$-\frac{1}{2}ibd^2\left(\sin^{-1}(cx)^2+\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right)+ad^2\log(x)+adex^2+\frac{1}{4}ae^2x^4+\frac{bde\left(cx\sqrt{1-c^2x^2}-\sin^{-1}(cx)\right)}{2c^2}+\frac{be^2\left(cx\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] a*d*e*x^2 + (a*e^2*x^4)/4 + (b*e^2*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) -
 3*ArcSin[c*x]))/(32*c^4) + (b*d*e*(c*x*Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(
2*c^2) + b*d*e*x^2*ArcSin[c*x] + (b*e^2*x^4*ArcSin[c*x])/4 + b*d^2*ArcSin[c
*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + a*d^2*Log[x] - (I/2)*b*d^2*(ArcSin[c*x
]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])])
```

Maple [A] time = 0.208, size = 272, normalized size = 1.2

$$\frac{ae^2x^4}{4}+aedx^2+d^2a\ln(cx)+\frac{b\arcsin(cx)e^2x^4}{4}+b\arcsin(cx)edx^2+\frac{bedx}{2c}\sqrt{-c^2x^2+1}+d^2b\arcsin(cx)\ln\left(1+icx+\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x)
```

```
[Out] 1/4*a*e^2*x^4+a*e*d*x^2+d^2*a*ln(c*x)+1/4*b*arcsin(c*x)*e^2*x^4+b*arcsin(c*
x)*e*d*x^2+1/2*b*d*e*x*(-c^2*x^2+1)^(1/2)/c+d^2*b*arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))+d^2*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*d^2*b*
polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-3/32*b*e^2*arcsin(c*x)/c^4+1/16*b*e^2*
x^3*(-c^2*x^2+1)^(1/2)/c+3/32*b*e^2*x*(-c^2*x^2+1)^(1/2)/c^3-1/2*b*d*e*arcs
in(c*x)/c^2-1/2*I*b*d^2*arcsin(c*x)^2-I*d^2*b*polylog(2,I*c*x+(-c^2*x^2+1)^
```

```
(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}\,ae^2x^4 + adex^2 + ad^2\log\left(x\right) + \int \frac{\left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/4*a*e^2*x^4 + a*d*e*x^2 + a*d^2*log(x) + integrate((b*e^2*x^4 + 2*b*d*e*x
^2 + b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arcsin\left(cx\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + b\,\mathrm{asin}\left(cx\right)\right)\left(d + ex^2\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**2/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2 + d\right)^2\left(b\arcsin\left(cx\right) + a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)/x, x)
```

3.611 $\int \frac{(d+ex^2)^2(a+b\sin^{-1}(cx))}{x^2}\,dx$

Optimal. Leaf size=126

$$-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)-bcd^2\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be\sqrt{1-c^2x^2}\left(6c^2d\right.}{3c^3}$$

```
[Out] (b*e*(6*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e^2*(1 - c^2*x^2)^(3/2))
/(9*c^3) - (d^2*(a + b*ArcSin[c*x]))/x + 2*d*e*x*(a + b*ArcSin[c*x]) + (e^2
*x^3*(a + b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rubi [A] time = 0.183663, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {270, 4731, 1251, 897, 1153, 208}

$$-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)-bcd^2\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be\sqrt{1-c^2x^2}\left(6c^2d\right.}{3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*(6*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e^2*(1 - c^2*x^2)^(3/2))
/(9*c^3) - (d^2*(a + b*ArcSin[c*x]))/x + 2*d*e*x*(a + b*ArcSin[c*x]) + (e^2
*x^3*(a + b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
```

```
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)-(bc)\int$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bc)$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{b\,\mathrm{Sub}}{}$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{b\,\mathrm{Sub}}{}$$

$$= \frac{be\left(6c^2d+e\right)\sqrt{1-c^2x^2}}{3c^3}-\frac{be^2\left(1-c^2x^2\right)^{3/2}}{9c^3}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\,\mathrm{s}\right.$$

$$= \frac{be\left(6c^2d+e\right)\sqrt{1-c^2x^2}}{3c^3}-\frac{be^2\left(1-c^2x^2\right)^{3/2}}{9c^3}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{x}+2dex\left(a+b\,\mathrm{s}\right.$$

Mathematica [A] time = 0.138299, size = 129, normalized size = 1.02

$$\frac{1}{9}\left(-\frac{9ad^2}{x}+18adex+3ae^2x^3-9bcd^2\log\left(\sqrt{1-c^2x^2}+1\right)+\frac{be\sqrt{1-c^2x^2}\left(c^2\left(18d+ex^2\right)+2e\right)}{c^3}+\frac{3b\sin^{-1}(cx)\left(-3d^2+\right.}{x}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] ((-9*a*d^2)/x + 18*a*d*e*x + 3*a*e^2*x^3 + (b*e*Sqrt[1 - c^2*x^2]*(2*e + c^
2*(18*d + e*x^2)))/c^3 + (3*b*(-3*d^2 + 6*d*e*x^2 + e^2*x^4)*ArcSin[c*x])/x
 + 9*b*c*d^2*Log[x] - 9*b*c*d^2*Log[1 + Sqrt[1 - c^2*x^2]])/9
```

Maple [A] time = 0.008, size = 168, normalized size = 1.3

$$c\left(\frac{a}{c^4}\left(\frac{e^2c^3x^3}{3}+2c^3edx-\frac{d^2c^3}{x}\right)+\frac{b}{c^4}\left(\frac{\arcsin(cx)e^2c^3x^3}{3}+2\arcsin(cx)c^3edx-\frac{\arcsin(cx)d^2c^3}{x}-\frac{e^2}{3}\left(-\frac{c^2x^2}{3}\sqrt{-c^2x^2}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] c*(a/c^4*(1/3*e^2*c^3*x^3+2*c^3*e*d*x-d^2*c^3/x)+b/c^4*(1/3*arcsin(c*x)*e^2
*c^3*x^3+2*arcsin(c*x)*c^3*e*d*x-arcsin(c*x)*d^2*c^3/x-1/3*e^2*(-1/3*c^2*x^
2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+2*c^2*e*d*(-c^2*x^2+1)^(1/2)-d
^2*c^4*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.46247, size = 204, normalized size = 1.62

$$\frac{1}{3}ae^2x^3 - \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bd^2 + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2 +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*e^2*x^3 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x
)/x)*b*d^2 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqr
t(-c^2*x^2 + 1)/c^4))*b*e^2 + 2*a*d*e*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^
2 + 1))*b*d*e/c - a*d^2/x
```

Fricas [A] time = 2.75518, size = 385, normalized size = 3.06

$$\frac{6ac^3e^2x^4 - 9bc^4d^2x\log\left(\sqrt{-c^2x^2+1}+1\right) + 9bc^4d^2x\log\left(\sqrt{-c^2x^2+1}-1\right) + 36ac^3dex^2 - 18ac^3d^2 + 6\left(bc^3e^2x^4 + 6bc^3d\right.}{18c^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/18*(6*a*c^3*e^2*x^4 - 9*b*c^4*d^2*x*log(sqrt(-c^2*x^2 + 1) + 1) + 9*b*c^4
*d^2*x*log(sqrt(-c^2*x^2 + 1) - 1) + 36*a*c^3*d*e*x^2 - 18*a*c^3*d^2 + 6*(b
*c^3*e^2*x^4 + 6*b*c^3*d*e*x^2 - 3*b*c^3*d^2)*arcsin(c*x) + 2*(b*c^2*e^2*x^
3 + 2*(9*b*c^2*d*e + b*e^2)*x)*sqrt(-c^2*x^2 + 1))/(c^3*x)
```

Sympy [A] time = 5.77377, size = 167, normalized size = 1.33

$$-\frac{ad^2}{x} + 2adex + \frac{ae^2x^3}{3} + bcd^2\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bce^2\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for } c \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3} - \frac{bd^2\operatorname{asi}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d**2/x + 2*a*d*e*x + a*e**2*x**3/3 + b*c*d**2*Piecewise((-acosh(1/(c*x))
, 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*e**2*Piecewise((-x*
```

```
*2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c, 0
)), (x**4/4, True))/3 - b*d**2*asin(c*x)/x + 2*b*d*e*Piecewise((0, Eq(c, 0)
), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*e**2*x**3*asin(c*x)/3
```

Giac [B] time = 3.077, size = 5733, normalized size = 45.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^12*d^2*x^8*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c
^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/2*a*c^12*d^
2*x^8/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + b*c^11*d^2*x^7*log(abs(c)*abs(x))/((c^1
0*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3
*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt
(-c^2*x^2 + 1) + 1)^7) - b*c^11*d^2*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^10*
x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c
^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-
c^2*x^2 + 1) + 1)^7) - 2*b*c^10*d^2*x^6*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x
^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^6) - 2*a*c^10*d^2*x^6/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(
sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(s
qrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 3*b*c^9*d^2*x^5*log(a
bs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^9*d^2*x^5*log(sqrt(-c^2*x
^2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^
2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^8*d^2*x^4*arcsin(c*x)/((c^
10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr
t(-c^2*x^2 + 1) + 1)^4) - 2*b*c^9*d*x^7*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 4*b
*c^8*d*x^6*arcsin(c*x)*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(
sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 3*a*c^8*d^2*x^4/((c^
10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr
t(-c^2*x^2 + 1) + 1)^4) + 4*a*c^8*d*x^6*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 3*b
*c^7*d^2*x^3*log(abs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c
^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^7*d^2*x
^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 2*b*c^6*d^2*x^
2*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 2*b*c^7*d*x^5*e/((c^10*x^7/(sqr
```

t(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(
sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2
+ 1) + 1)^5) + 8*b*c^6*d*x^4*arcsin(c*x)*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1
) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 2*
a*c^6*d^2*x^2/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 2/9*b*c^7*x^7*e^2/((c^10*x^7/(s
qrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1)^7) + 8*a*c^6*d*x^4*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*
c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + b*c^5*d^2*x*
log(abs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(
-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^5*d^2*x*log(sqrt(-c^2*x^
2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2
 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c^4*d^2*arcsin(c*x)/(c^10*x^7
/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*
x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1)) + 2*b*c^5*
d*x^3*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 +
1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1
) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) + 4*b*c^4*d*x^2*arcsin(c*x)*e/((c^10*x^
7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^
2*x^2 + 1) + 1)^2) - 1/2*a*c^4*d^2/(c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3
*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
+ c^4*x/(sqrt(-c^2*x^2 + 1) + 1)) - 2/3*b*c^5*x^5*e^2/((c^10*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
 1)^5) + 8/3*b*c^4*x^4*arcsin(c*x)*e^2/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^
7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) +
1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 4*a*c^
4*d*x^2*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2
+ 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 +
 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + 8/3*a*c^4*x^4*e^2/((c^10*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^4) + 2*b*c^3*d*x*e/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^
5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x
/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) + 2/3*b*c^3*x^3*e^2/((
c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
+ 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^3) + 2/9*b*c*x*e^2/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1))

3.612 $\int \frac{(d+ex^2)^2 (a+b\sin^{-1}(cx))}{x^3} \, dx$

Optimal. Leaf size=185

$$-ibde\mathrm{PolyLog}\left(2, e^{2i\sin^{-1}(cx)}\right) - \frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2} + 2de\log(x)\left(a+b\sin^{-1}(cx)\right) + \frac{1}{2}e^2x^2\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\sqrt{}}{2}$$

```
[Out] -(b*c*d^2*Sqrt[1 - c^2*x^2])/(2*x) + (b*e^2*x*Sqrt[1 - c^2*x^2])/(4*c) - (b
*e^2*ArcSin[c*x])/(4*c^2) - I*b*d*e*ArcSin[c*x]^2 - (d^2*(a + b*ArcSin[c*x]
))/(2*x^2) + (e^2*x^2*(a + b*ArcSin[c*x]))/2 + 2*b*d*e*ArcSin[c*x]*Log[1 -
E^((2*I)*ArcSin[c*x])] - 2*b*d*e*ArcSin[c*x]*Log[x] + 2*d*e*(a + b*ArcSin[c
*x])*Log[x] - I*b*d*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.338032, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 14, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {266, 43, 4731, 12, 6742, 264, 321, 216, 2326, 4625, 3717, 2190, 2279, 2391}

$$-ibde\mathrm{PolyLog}\left(2, e^{2i\sin^{-1}(cx)}\right) - \frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2} + 2de\log(x)\left(a+b\sin^{-1}(cx)\right) + \frac{1}{2}e^2x^2\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\sqrt{}}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -(b*c*d^2*Sqrt[1 - c^2*x^2])/(2*x) + (b*e^2*x*Sqrt[1 - c^2*x^2])/(4*c) - (b
*e^2*ArcSin[c*x])/(4*c^2) - I*b*d*e*ArcSin[c*x]^2 - (d^2*(a + b*ArcSin[c*x]
))/(2*x^2) + (e^2*x^2*(a + b*ArcSin[c*x]))/2 + 2*b*d*e*ArcSin[c*x]*Log[1 -
E^((2*I)*ArcSin[c*x])] - 2*b*d*e*ArcSin[c*x]*Log[x] + 2*d*e*(a + b*ArcSin[c
*x])*Log[x] - I*b*d*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx = -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\sin^{-1}(cx)\right)+2de\left(a+b\sin^{-1}(cx)\right)\log(x)-($$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\sin^{-1}(cx)\right)+2de\left(a+b\sin^{-1}(cx)\right)\log(x)-$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\sin^{-1}(cx)\right)+2de\left(a+b\sin^{-1}(cx)\right)\log(x)-$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\sin^{-1}(cx)\right)+2de\left(a+b\sin^{-1}(cx)\right)\log(x)+$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\sin^{-1}(cx\right.$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2-\frac{d^2\left(a+b\sin\right.}{2x}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2-\frac{d^2\left(a+b\sin\right.}{2x}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2-\frac{d^2\left(a+b\sin\right.}{2x}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2-\frac{d^2\left(a+b\sin\right.}{2x}$$

Mathematica [A] time = 0.333032, size = 159, normalized size = 0.86

$$\frac{1}{4}\left(-4ibde\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)-\frac{2ad^2}{x^2}+8ade\log(x)+2ae^2x^2+b\sin^{-1}(cx)\left(-\frac{e^2}{c^2}+8de\log\left(1-e^{2i\sin^{-1}(cx)}\right)-\frac{2d^2}{x^2}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] ((-2*a*d^2)/x^2 + 2*a*e^2*x^2 - (2*b*c*d^2*Sqrt[1 - c^2*x^2])/x + (b*e^2*x*
Sqrt[1 - c^2*x^2])/c - (4*I)*b*d*e*ArcSin[c*x]^2 + b*ArcSin[c*x]*(-(e^2/c^2
) - (2*d^2)/x^2 + 2*e^2*x^2 + 8*d*e*Log[1 - E^((2*I)*ArcSin[c*x])]) + 8*a*d
*e*Log[x] - (4*I)*b*d*e*PolyLog[2, E^((2*I)*ArcSin[c*x])])/4
```

Maple [A] time = 0.371, size = 248, normalized size = 1.3

$$\frac{ax^2e^2}{2}-\frac{ad^2}{2x^2}+2aed\ln(cx)-ibde(\arcsin(cx))^2+\frac{be^2x}{4c}\sqrt{-c^2x^2+1}+\frac{b\arcsin(cx)x^2e^2}{2}-\frac{be^2\arcsin(cx)}{4c^2}+\frac{i}{2}c^2bd^2-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] 1/2*a*x^2*e^2-1/2*a*d^2/x^2+2*a*e*d*ln(c*x)-I*b*d*e*arcsin(c*x)^2+1/4*b*e^2
*x*(-c^2*x^2+1)^(1/2)/c+1/2*b*arcsin(c*x)*x^2*e^2-1/4*b*e^2*arcsin(c*x)/c^2
+1/2*I*c^2*b*d^2-1/2*b*c*d^2*(-c^2*x^2+1)^(1/2)/x-1/2*b*arcsin(c*x)*d^2/x^2
+2*b*e*d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*b*e*d*arcsin(c*x)*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b*e*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-
2*I*b*e*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\,ae^2x^2 - \frac{1}{2}\,bd^2\left(\frac{\sqrt{-c^2x^2+1}c}{x} + \frac{\arcsin(cx)}{x^2}\right) + 2\,ade\log(x) - \frac{ad^2}{2\,x^2} + \int \frac{\left(be^2x^2 + 2\,bde\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*e^2*x^2 - 1/2*b*d^2*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) + 2*a*
d*e*log(x) - 1/2*a*d^2/x^2 + integrate((b*e^2*x^2 + 2*b*d*e)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arcsin(cx)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\,\mathrm{asin}(cx))\left(d + ex^2\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**2/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2 + d\right)^2 (b\arcsin(cx) + a)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")

[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)/x^3, x)
```

3.613 $\int \frac{(d+ex^2)^2 (a+b\sin^{-1}(cx))}{x^4} dx$

Optimal. Leaf size=126

$$-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e^2x\left(a+b\sin^{-1}(cx)\right)-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{1}{6}bcd\left(c^2d+12e\right)\tanh^{-1}\left(\sqrt{1-c\right.$$

```
[Out] (b*e^2*Sqrt[1 - c^2*x^2])/c - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) - (2*d*e*(a + b*ArcSin[c*x]))/x + e^2*x*(a + b*A
rcSin[c*x]) - (b*c*d*(c^2*d + 12*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rubi [A] time = 0.201253, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {270, 4731, 1251, 897, 1157, 388, 208}

$$-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e^2x\left(a+b\sin^{-1}(cx)\right)-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{1}{6}bcd\left(c^2d+12e\right)\tanh^{-1}\left(\sqrt{1-c\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```


```
[Out] (b*e^2*Sqrt[1 - c^2*x^2])/c - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) - (2*d*e*(a + b*ArcSin[c*x]))/x + e^2*x*(a + b*A
rcSin[c*x]) - (b*c*d*(c^2*d + 12*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
```

```
ctionQ[m]
```

Rule 1157

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, -Simp[(R*x*(d + e*x^2)^(q + 1))/(2*d*(q + 1)), x] + Dist[1/(2*d*(q +
 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x],
 x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 -
 b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx = -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e^2x\left(a+b\sin^{-1}(cx)\right)-(bc)\int \frac{-}{}$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e^2x\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bc)\,\mathrm{Sub}$$

$$= -\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e^2x\left(a+b\sin^{-1}(cx)\right)+\frac{b\,\mathrm{Subst}\Big(}{}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e^2x\left(a+b\sin^{-1}\right.$$

$$= \frac{be^2\sqrt{1-c^2x^2}}{c}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e$$

$$= \frac{be^2\sqrt{1-c^2x^2}}{c}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\sin^{-1}(cx)\right)}{x}+e$$

Mathematica [A] time = 0.162501, size = 140, normalized size = 1.11

$$\frac{1}{6}\left(-\frac{2ad^2}{x^3}-\frac{12ade}{x}+6ae^2x+6b\sqrt{1-c^2x^2}\left(\frac{e^2}{c}-\frac{cd^2}{6x^2}\right)-bcd\left(c^2d+12e\right)\log\left(\sqrt{1-c^2x^2}+1\right)+bcd\log(x)\left(c^2d+12e\right)\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^2)/x^3 - (12*a*d*e)/x + 6*a*e^2*x + 6*b*(e^2/c - (c*d^2)/(6*x^2))*
Sqrt[1 - c^2*x^2] - (2*b*(d^2 + 6*d*e*x^2 - 3*e^2*x^4)*ArcSin[c*x])/x^3 + b
*c*d*(c^2*d + 12*e)*Log[x] - b*c*d*(c^2*d + 12*e)*Log[1 + Sqrt[1 - c^2*x^2]
])/6
```

Maple [A] time = 0.01, size = 156, normalized size = 1.2

$$c^3\left(\frac{a}{c^4}\left(cxe^2-2\frac{ced}{x}-\frac{d^2c}{3x^3}\right)+\frac{b}{c^4}\left(\arcsin(cx)cxe^2-2\frac{\arcsin(cx)ced}{x}-\frac{\arcsin(cx)d^2c}{3x^3}+e^2\sqrt{-c^2x^2+1}-2c^2ed\mathrm{Artanh}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] c^3*(a/c^4*(c*x*e^2-2*c*e*d/x-1/3*d^2*c/x^3)+b/c^4*(arcsin(c*x)*c*x*e^2-2*a
rcsin(c*x)*c*e*d/x-1/3*arcsin(c*x)*d^2*c/x^3+e^2*(-c^2*x^2+1)^(1/2)-2*c^2*e
*d*arctanh(1/(-c^2*x^2+1)^(1/2))+1/3*d^2*c^4*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/
2)-1/2*arctanh(1/(-c^2*x^2+1)^(1/2)))))
```

Maxima [A] time = 1.45057, size = 215, normalized size = 1.71

$$-\frac{1}{6}\left(\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd^2-2\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)
/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^2 - 2*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) +
 2/abs(x)) + arcsin(c*x)/x)*b*d*e + a*e^2*x + (c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*b*e^2/c - 2*a*d*e/x - 1/3*a*d^2/x^3
```

Fricas [A] time = 2.86726, size = 393, normalized size = 3.12

$$\frac{12\,ace^2x^4-24\,acdex^2-\left(bc^4d^2+12\,bc^2de\right)x^3\log\left(\sqrt{-c^2x^2+1}+1\right)+\left(bc^4d^2+12\,bc^2de\right)x^3\log\left(\sqrt{-c^2x^2+1}-1\right)-4\,acd^2}{12\,cx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(12*a*c*e^2*x^4 - 24*a*c*d*e*x^2 - (b*c^4*d^2 + 12*b*c^2*d*e)*x^3*log(
sqrt(-c^2*x^2 + 1) + 1) + (b*c^4*d^2 + 12*b*c^2*d*e)*x^3*log(sqrt(-c^2*x^2
+ 1) - 1) - 4*a*c*d^2 + 4*(3*b*c*e^2*x^4 - 6*b*c*d*e*x^2 - b*c*d^2)*arcsin(
c*x) - 2*(b*c^2*d^2*x - 6*b*e^2*x^3)*sqrt(-c^2*x^2 + 1))/(c*x^3)
```

Sympy [A] time = 7.1506, size = 219, normalized size = 1.74

$$-\frac{ad^2}{3x^3}-\frac{2ade}{x}+ae^2x+\frac{bcd^2\left(\begin{cases}-\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2}-\frac{c\sqrt{-1+\frac{1}{c^2x^2}}}{2x} & \text{for } \frac{1}{|c^2x^2|}>1\\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2}-\frac{ic}{2x\sqrt{1-\frac{1}{c^2x^2}}}+\frac{i}{2cx^3\sqrt{1-\frac{1}{c^2x^2}}} & \text{otherwise}\end{cases}\right)}{3}+2bcde\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) - 2*a*d*e/x + a*e**2*x + b*c*d**2*Piecewise((-c**2*acosh(1
/(c*x))/2 - c*sqrt(-1 + 1/(c**2*x**2))/(2*x), 1/Abs(c**2*x**2) > 1), (I*c**
2*asin(1/(c*x))/2 - I*c/(2*x*sqrt(1 - 1/(c**2*x**2))) + I/(2*c*x**3*sqrt(1
- 1/(c**2*x**2))), True))/3 + 2*b*c*d*e*Piecewise((-acosh(1/(c*x)), 1/Abs(c
**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*d**2*asin(c*x)/(3*x**3) - 2*b*
d*e*asin(c*x)/x + b*e**2*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2
*x**2 + 1)/c, True))
```

Giac [B] time = 84.8751, size = 3429, normalized size = 27.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^12*d^2*x^8*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/24*a*c^12*
d^2*x^8/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) + 1/24*b*c^11*d^2*x^7/((c^6*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
1) + 1)^7) - 1/6*b*c^10*d^2*x^6*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 1
/6*a*c^10*d^2*x^6/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) + 1/6*b*c^9*d^2*x^5*log(abs(c
)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1
) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/6*b*c^9*d^2*x^5*log(sqrt(-c^2*x^2
 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 1/24*b*c^9*d^2*x^5/((c^6*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
+ 1) + 1)^5) - 1/4*b*c^8*d^2*x^4*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1)
+ 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) -
b*c^8*d*x^6*arcsin(c*x)*e/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 1/4*a*c^8*d^2*x^4/(
(c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(
sqrt(-c^2*x^2 + 1) + 1)^4) - a*c^8*d*x^6*e/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) + 1/
6*b*c^7*d^2*x^3*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c
^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 2*b*c^7*d*
x^5*e*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/6*b*c^7*d^2*x^3*lo
g(sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 2*b*c^7*d*x^5*e*log
```

```
(sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/24*b*c^7*d^2*x^3/(
(c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(
sqrt(-c^2*x^2 + 1) + 1)^3) - 1/6*b*c^6*d^2*x^2*arcsin(c*x)/((c^6*x^5/(sqrt(
-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
 1) + 1)^2) - 2*b*c^6*d*x^4*arcsin(c*x)*e/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1
)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/6
*a*c^6*d^2*x^2/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^
2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) - 2*a*c^6*d*x^4*e/((c^6*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^4) + 2*b*c^5*d*x^3*e*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2
 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)
^3) - 2*b*c^5*d*x^3*e*log(sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2
+ 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^
3) - 1/24*b*c^5*d^2*x/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(
-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)) - 1/24*b*c^4*d^2*arcsin(c*x
)/(c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)
 - b*c^4*d*x^2*arcsin(c*x)*e/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) - 1/24*a*c^4*d^2/(
c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3) -
b*c^5*x^5*e^2/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2
 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 2*b*c^4*x^4*arcsin(c*x)*e^2/((c
^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sq
rt(-c^2*x^2 + 1) + 1)^4) - a*c^4*d*x^2*e/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)
^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) + 2*a*
c^4*x^4*e^2/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) + b*c^3*x^3*e^2/((c^6*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1)
 + 1)^3)
```

3.614 $\int x^4 \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=341

$$\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\sin^{-1}(cx)\right)+\frac{1}{11}e^3x^{11}\left(a+b\sin^{-1}(cx)\right)-\frac{be\left(1-c^2\right.}{}$$

```
[Out] (b*(231*c^6*d^3 + 495*c^4*d^2*e + 385*c^2*d*e^2 + 105*e^3)*Sqrt[1 - c^2*x^2
])/(1155*c^11) - (b*(462*c^6*d^3 + 1485*c^4*d^2*e + 1540*c^2*d*e^2 + 525*e^
3)*(1 - c^2*x^2)^(3/2))/(3465*c^11) + (b*(77*c^6*d^3 + 495*c^4*d^2*e + 770*
c^2*d*e^2 + 350*e^3)*(1 - c^2*x^2)^(5/2))/(1925*c^11) - (b*e*(99*c^4*d^2 +
308*c^2*d*e + 210*e^2)*(1 - c^2*x^2)^(7/2))/(1617*c^11) + (b*e^2*(11*c^2*d
+ 15*e)*(1 - c^2*x^2)^(9/2))/(297*c^11) - (b*e^3*(1 - c^2*x^2)^(11/2))/(121
*c^11) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*d^2*e*x^7*(a + b*ArcSin[c*x])
)/7 + (d*e^2*x^9*(a + b*ArcSin[c*x]))/3 + (e^3*x^11*(a + b*ArcSin[c*x]))/11
```

Rubi [A] time = 0.434835, antiderivative size = 341, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {270, 4731, 12, 1799, 1620}

$$\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\sin^{-1}(cx)\right)+\frac{1}{11}e^3x^{11}\left(a+b\sin^{-1}(cx)\right)-\frac{be\left(1-c^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*(231*c^6*d^3 + 495*c^4*d^2*e + 385*c^2*d*e^2 + 105*e^3)*Sqrt[1 - c^2*x^2
])/(1155*c^11) - (b*(462*c^6*d^3 + 1485*c^4*d^2*e + 1540*c^2*d*e^2 + 525*e^
3)*(1 - c^2*x^2)^(3/2))/(3465*c^11) + (b*(77*c^6*d^3 + 495*c^4*d^2*e + 770*
c^2*d*e^2 + 350*e^3)*(1 - c^2*x^2)^(5/2))/(1925*c^11) - (b*e*(99*c^4*d^2 +
308*c^2*d*e + 210*e^2)*(1 - c^2*x^2)^(7/2))/(1617*c^11) + (b*e^2*(11*c^2*d
+ 15*e)*(1 - c^2*x^2)^(9/2))/(297*c^11) - (b*e^3*(1 - c^2*x^2)^(11/2))/(121
*c^11) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*d^2*e*x^7*(a + b*ArcSin[c*x])
)/7 + (d*e^2*x^9*(a + b*ArcSin[c*x]))/3 + (e^3*x^11*(a + b*ArcSin[c*x]))/11
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rubi steps

$$\int x^4 \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\sin^{-1}(cx)\right)+$$

$$=\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\sin^{-1}(cx)\right)+$$

$$=\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\sin^{-1}(cx)\right)+$$

$$=\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\sin^{-1}(cx)\right)+$$

$$=\frac{b\left(231c^6d^3+495c^4d^2e+385c^2de^2+105e^3\right)\sqrt{1-c^2x^2}}{1155c^{11}}-\frac{b\left(462c^6d^3+1485c^4d^2e\right.}{}$$

Mathematica [A] time = 0.261638, size = 271, normalized size = 0.79

$$\frac{3465ax^5\left(495d^2ex^2+231d^3+385de^2x^4+105e^3x^6\right)+\frac{b\sqrt{1-c^2x^2}\left(c^{10}x^4\left(245025d^2ex^2+160083d^3+148225de^2x^4+33075e^3x^6\right)+2c^8\left(147015d^2ex^4\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3465*a*x^5*(231*d^3 + 495*d^2*e*x^2 + 385*d*e^2*x^4 + 105*e^3*x^6) + (b*Sq
rt[1 - c^2*x^2]*(134400*e^3 + 4480*c^2*e^2*(121*d + 15*e*x^2) + 80*c^4*e*(9
801*d^2 + 3388*d*e*x^2 + 630*e^2*x^4) + 24*c^6*(17787*d^3 + 16335*d^2*e*x^2
 + 8470*d*e^2*x^4 + 1750*e^3*x^6) + c^10*x^4*(160083*d^3 + 245025*d^2*e*x^2
 + 148225*d*e^2*x^4 + 33075*e^3*x^6) + 2*c^8*(106722*d^3*x^2 + 147015*d^2*e
*x^4 + 84700*d*e^2*x^6 + 18375*e^3*x^8)))/c^11 + 3465*b*x^5*(231*d^3 + 495*
d^2*e*x^2 + 385*d*e^2*x^4 + 105*e^3*x^6)*ArcSin[c*x])/4002075
```

Maple [A] time = 0.016, size = 497, normalized size = 1.5

$$\frac{1}{c^5}\left(\frac{a}{c^6}\left(\frac{e^3c^{11}x^{11}}{11}+\frac{c^{11}de^2x^9}{3}+\frac{3c^{11}d^2ex^7}{7}+\frac{c^{11}x^5d^3}{5}\right)+\frac{b}{c^6}\left(\frac{\arcsin(cx)e^3c^{11}x^{11}}{11}+\frac{\arcsin(cx)c^{11}de^2x^9}{3}+\frac{3\arcsin(cx)c}{7}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^5*(a/c^6*(1/11*e^3*c^11*x^11+1/3*c^11*d*e^2*x^9+3/7*c^11*d^2*e*x^7+1/5*
c^11*x^5*d^3)+b/c^6*(1/11*arcsin(c*x)*e^3*c^11*x^11+1/3*arcsin(c*x)*c^11*d*
e^2*x^9+3/7*arcsin(c*x)*c^11*d^2*e*x^7+1/5*arcsin(c*x)*c^11*x^5*d^3-1/11*e^
3*(-1/11*c^10*x^10*(-c^2*x^2+1)^(1/2)-10/99*c^8*x^8*(-c^2*x^2+1)^(1/2)-80/6
93*c^6*x^6*(-c^2*x^2+1)^(1/2)-32/231*c^4*x^4*(-c^2*x^2+1)^(1/2)-128/693*c^2
*x^2*(-c^2*x^2+1)^(1/2)-256/693*(-c^2*x^2+1)^(1/2))-1/3*c^2*d*e^2*(-1/9*c^8
*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*x^4*(-c^
2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+1)^(1/2)
)-3/7*c^4*d^2*e*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^
(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-1/5*d^3*c^6
*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^
2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.49536, size = 628, normalized size = 1.84

$$\frac{1}{11}ae^3x^{11}+\frac{1}{3}ade^2x^9+\frac{3}{7}ad^2ex^7+\frac{1}{5}ad^3x^5+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2}}{c^6}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/11*a*e^3*x^11 + 1/3*a*d*e^2*x^9 + 3/7*a*d^2*e*x^7 + 1/5*a*d^3*x^5 + 1/75*
(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*
x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^3 + 3/245*(35*x^7*arcsin(c*x) +
(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*
x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d^2*e + 1/945*(315*x^9*a
rcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4
 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt
(-c^2*x^2 + 1)/c^10)*c)*b*d*e^2 + 1/7623*(693*x^11*arcsin(c*x) + (63*sqrt(-
c^2*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 +
1)*x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^1
0 + 256*sqrt(-c^2*x^2 + 1)/c^12)*c)*b*e^3
```

Fricas [A] time = 2.06498, size = 846, normalized size = 2.48

$$\frac{363825\,ac^{11}e^3x^{11}+1334025\,ac^{11}de^2x^9+1715175\,ac^{11}d^2ex^7+800415\,ac^{11}d^3x^5+3465\left(105\,bc^{11}e^3x^{11}+385\,bc^{11}de^2x^9\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/4002075*(363825*a*c^11*e^3*x^11 + 1334025*a*c^11*d*e^2*x^9 + 1715175*a*c^
11*d^2*e*x^7 + 800415*a*c^11*d^3*x^5 + 3465*(105*b*c^11*e^3*x^11 + 385*b*c^
11*d*e^2*x^9 + 495*b*c^11*d^2*e*x^7 + 231*b*c^11*d^3*x^5)*arcsin(c*x) + (33
075*b*c^10*e^3*x^10 + 426888*b*c^6*d^3 + 1225*(121*b*c^10*d*e^2 + 30*b*c^8*
e^3)*x^8 + 784080*b*c^4*d^2*e + 25*(9801*b*c^10*d^2*e + 6776*b*c^8*d*e^2 +
1680*b*c^6*e^3)*x^6 + 542080*b*c^2*d*e^2 + 3*(53361*b*c^10*d^3 + 98010*b*c^
8*d^2*e + 67760*b*c^6*d*e^2 + 16800*b*c^4*e^3)*x^4 + 134400*b*e^3 + 4*(5336
1*b*c^8*d^3 + 98010*b*c^6*d^2*e + 67760*b*c^4*d*e^2 + 16800*b*c^2*e^3)*x^2)
```

```
*sqrt(-c^2*x^2 + 1))/c^11
```

Sympy [A] time = 65.6259, size = 631, normalized size = 1.85

$$\begin{cases} \frac{ad^3x^5}{5} + \frac{3ad^2ex^7}{7} + \frac{ade^2x^9}{3} + \frac{ae^3x^{11}}{11} + \frac{bd^3x^5 \operatorname{asin}(cx)}{5} + \frac{3bd^2ex^7 \operatorname{asin}(cx)}{7} + \frac{bde^2x^9 \operatorname{asin}(cx)}{3} + \frac{be^3x^{11} \operatorname{asin}(cx)}{11} + \frac{bd^3x^4\sqrt{-c^2x^2+1}}{25c} + \frac{3bd^2ex^6\sqrt{-c}}{49c} \\ a\left(\frac{d^3x^5}{5} + \frac{3d^2ex^7}{7} + \frac{de^2x^9}{3} + \frac{e^3x^{11}}{11}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**5/5 + 3*a*d**2*e*x**7/7 + a*d*e**2*x**9/3 + a*e**3*x**
11/11 + b*d**3*x**5*asin(c*x)/5 + 3*b*d**2*e*x**7*asin(c*x)/7 + b*d*e**2*x*
*9*asin(c*x)/3 + b*e**3*x**11*asin(c*x)/11 + b*d**3*x**4*sqrt(-c**2*x**2 +
1)/(25*c) + 3*b*d**2*e*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b*d*e**2*x**8*sqr
t(-c**2*x**2 + 1)/(27*c) + b*e**3*x**10*sqrt(-c**2*x**2 + 1)/(121*c) + 4*b*
d**3*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 18*b*d**2*e*x**4*sqrt(-c**2*x**2
 + 1)/(245*c**3) + 8*b*d*e**2*x**6*sqrt(-c**2*x**2 + 1)/(189*c**3) + 10*b*e
**3*x**8*sqrt(-c**2*x**2 + 1)/(1089*c**3) + 8*b*d**3*sqrt(-c**2*x**2 + 1)/(
75*c**5) + 24*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*d*e**2*x
**4*sqrt(-c**2*x**2 + 1)/(315*c**5) + 80*b*e**3*x**6*sqrt(-c**2*x**2 + 1)/(
7623*c**5) + 48*b*d**2*e*sqrt(-c**2*x**2 + 1)/(245*c**7) + 64*b*d*e**2*x**2
*sqrt(-c**2*x**2 + 1)/(945*c**7) + 32*b*e**3*x**4*sqrt(-c**2*x**2 + 1)/(254
1*c**7) + 128*b*d*e**2*sqrt(-c**2*x**2 + 1)/(945*c**9) + 128*b*e**3*x**2*sq
rt(-c**2*x**2 + 1)/(7623*c**9) + 256*b*e**3*sqrt(-c**2*x**2 + 1)/(7623*c**1
1), Ne(c, 0)), (a*(d**3*x**5/5 + 3*d**2*e*x**7/7 + d*e**2*x**9/3 + e**3*x**
11/11), True))
```

Giac [B] time = 1.36202, size = 1253, normalized size = 3.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/11*a*x^11*e^3 + 1/3*a*d*x^9*e^2 + 3/7*a*d^2*x^7*e + 1/5*a*d^3*x^5 + 1/5*(
c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*d^3*x*arcsin(c
*x)/c^4 + 3/7*(c^2*x^2 - 1)^3*b*d^2*x*arcsin(c*x)*e/c^6 + 1/5*b*d^3*x*arcsi
n(c*x)/c^4 + 9/7*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(c*x)*e/c^6 + 1/25*(c^2*x^2
- 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 1/3*(c^2*x^2 - 1)^4*b*d*x*arcsin(c*x)
*e^2/c^8 + 9/7*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)*e/c^6 - 2/15*(-c^2*x^2 + 1
)^(3/2)*b*d^3/c^5 + 3/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^2*e/c^7 + 4
/3*(c^2*x^2 - 1)^3*b*d*x*arcsin(c*x)*e^2/c^8 + 3/7*b*d^2*x*arcsin(c*x)*e/c^
6 + 1/5*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 9/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 +
 1)*b*d^2*e/c^7 + 1/11*(c^2*x^2 - 1)^5*b*x*arcsin(c*x)*e^3/c^10 + 2*(c^2*x^
2 - 1)^2*b*d*x*arcsin(c*x)*e^2/c^8 + 1/27*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1
)*b*d*e^2/c^9 - 3/7*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^7 + 5/11*(c^2*x^2 - 1)^4
*b*x*arcsin(c*x)*e^3/c^10 + 4/3*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)*e^2/c^8 + 4
/21*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^9 + 3/7*sqrt(-c^2*x^2 + 1)
*b*d^2*e/c^7 + 10/11*(c^2*x^2 - 1)^3*b*x*arcsin(c*x)*e^3/c^10 + 1/3*b*d*x*a
rcsin(c*x)*e^2/c^8 + 1/121*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b*e^3/c^11 +
2/5*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^9 + 10/11*(c^2*x^2 - 1)^2*
```

```
b*x*arcsin(c*x)*e^3/c^10 + 5/99*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^3/c^
11 - 4/9*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/c^9 + 5/11*(c^2*x^2 - 1)*b*x*arcsin(c
*x)*e^3/c^10 + 10/77*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3/c^11 + 1/3*sq
rt(-c^2*x^2 + 1)*b*d*e^2/c^9 + 1/11*b*x*arcsin(c*x)*e^3/c^10 + 2/11*(c^2*x^
2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3/c^11 - 5/33*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^
11 + 1/11*sqrt(-c^2*x^2 + 1)*b*e^3/c^11
```

3.615 $\int x^3 \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=380

$$\frac{\left(d+ex^2\right)^5 \left(a+b\sin^{-1}(cx)\right)}{10e^2}-\frac{d\left(d+ex^2\right)^4 \left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{bx\sqrt{1-c^2x^2}\left(26c^4d^2+201c^2de+126e^2\right)\left(d+ex^2\right)^2}{9600c^5e}-\frac{bx}{}$$

```
[Out] -(b*(1232*c^8*d^4 - 2536*c^6*d^3*e - 7758*c^4*d^2*e^2 - 6615*c^2*d*e^3 - 18
90*e^4)*x*Sqrt[1 - c^2*x^2])/(76800*c^9*e) - (b*(136*c^6*d^3 - 1096*c^4*d^2
*e - 1617*c^2*d*e^2 - 630*e^3)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(38400*c^7*
e) + (b*(26*c^4*d^2 + 201*c^2*d*e + 126*e^2)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2
)^2)/(9600*c^5*e) + (b*(11*c^2*d + 18*e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^3)
/(1600*c^3*e) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^4)/(100*c*e) + (b*(128*c
^10*d^5 - 480*c^6*d^3*e^2 - 800*c^4*d^2*e^3 - 525*c^2*d*e^4 - 126*e^5)*ArcS
in[c*x])/(5120*c^10*e^2) - (d*(d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e^2) +
((d + e*x^2)^5*(a + b*ArcSin[c*x]))/(10*e^2)
```

Rubi [A] time = 0.508353, antiderivative size = 380, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {266, 43, 4731, 12, 528, 388, 216}

$$\frac{\left(d+ex^2\right)^5 \left(a+b\sin^{-1}(cx)\right)}{10e^2}-\frac{d\left(d+ex^2\right)^4 \left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{bx\sqrt{1-c^2x^2}\left(26c^4d^2+201c^2de+126e^2\right)\left(d+ex^2\right)^2}{9600c^5e}-\frac{bx}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -(b*(1232*c^8*d^4 - 2536*c^6*d^3*e - 7758*c^4*d^2*e^2 - 6615*c^2*d*e^3 - 18
90*e^4)*x*Sqrt[1 - c^2*x^2])/(76800*c^9*e) - (b*(136*c^6*d^3 - 1096*c^4*d^2
*e - 1617*c^2*d*e^2 - 630*e^3)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(38400*c^7*
e) + (b*(26*c^4*d^2 + 201*c^2*d*e + 126*e^2)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2
)^2)/(9600*c^5*e) + (b*(11*c^2*d + 18*e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^3)
/(1600*c^3*e) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^4)/(100*c*e) + (b*(128*c
^10*d^5 - 480*c^6*d^3*e^2 - 800*c^4*d^2*e^3 - 525*c^2*d*e^4 - 126*e^5)*ArcS
in[c*x])/(5120*c^10*e^2) - (d*(d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e^2) +
((d + e*x^2)^5*(a + b*ArcSin[c*x]))/(10*e^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
```

```
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x^3\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)dx=-\frac{d\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10e^2}-(bc)\int\frac{(d+e}{40}$$

$$=-\frac{d\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10e^2}-\frac{(bc)\int\frac{\left(d+ex^2\right)^4}{\sqrt{1-}}}{40e}$$

$$=\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^4}{100ce}-\frac{d\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\sin\right.}{10e^2}$$

$$=\frac{b\left(11c^2d+18e\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)^3}{1600c^3e}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^4}{100ce}-\frac{d\left(d+ex^2\right)}{}$$

$$=\frac{b\left(26c^4d^2+201c^2de+126e^2\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{9600c^5e}+\frac{b\left(11c^2d+18e\right)x\sqrt{1-c}}{1600c^3e}$$

$$=-\frac{b\left(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{38400c^7e}+\frac{b\left(26c^4\right.}{}$$

$$=-\frac{b\left(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4\right)x\sqrt{1-c^2x^2}}{76800c^9e}-$$

$$=-\frac{b\left(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4\right)x\sqrt{1-c^2x^2}}{76800c^9e}-$$

Mathematica [A] time = 0.24171, size = 276, normalized size = 0.73

$$\frac{cx\left(1920ac^9x^3\left(20d^2ex^2+10d^3+15de^2x^4+4e^3x^6\right)+b\sqrt{1-c^2x^2}\left(16c^8\left(400d^2ex^4+300d^3x^2+225de^2x^6+48e^3x^8\right)+8c^6\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(1920*a*c^9*x^3*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6) + b
*Sqrt[1 - c^2*x^2]*(1890*e^3 + 315*c^2*e^2*(25*d + 4*e*x^2) + 6*c^4*e*(2000
*d^2 + 875*d*e*x^2 + 168*e^2*x^4) + 8*c^6*(900*d^3 + 1000*d^2*e*x^2 + 525*d
*e^2*x^4 + 108*e^3*x^6) + 16*c^8*(300*d^3*x^2 + 400*d^2*e*x^4 + 225*d*e^2*x
^6 + 48*e^3*x^8))) + 15*b*(-480*c^6*d^3 - 800*c^4*d^2*e - 525*c^2*d*e^2 - 1
26*e^3 + 128*c^10*x^4*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6))*A
rcSin[c*x])/(76800*c^10)
```

Maple [A] time = 0.006, size = 449, normalized size = 1.2

$$\frac{1}{c^4}\left(\frac{a}{c^6}\left(\frac{e^3c^{10}x^{10}}{10}+\frac{3\,c^{10}de^2x^8}{8}+\frac{c^{10}d^2ex^6}{2}+\frac{x^4c^{10}d^3}{4}\right)+\frac{b}{c^6}\left(\frac{\arcsin(cx)\,e^3c^{10}x^{10}}{10}+\frac{3\,\arcsin(cx)\,c^{10}de^2x^8}{8}+\frac{\arcsin(cx)\,c\cdots}{2}\cdots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^4*(a/c^6*(1/10*e^3*c^10*x^10+3/8*c^10*d*e^2*x^8+1/2*c^10*d^2*e*x^6+1/4*
x^4*c^10*d^3)+b/c^6*(1/10*arcsin(c*x)*e^3*c^10*x^10+3/8*arcsin(c*x)*c^10*d*
e^2*x^8+1/2*arcsin(c*x)*c^10*d^2*e*x^6+1/4*arcsin(c*x)*c^10*x^4*d^3-1/10*e^
3*(-1/10*c^9*x^9*(-c^2*x^2+1)^(1/2)-9/80*c^7*x^7*(-c^2*x^2+1)^(1/2)-21/160*
c^5*x^5*(-c^2*x^2+1)^(1/2)-21/128*c^3*x^3*(-c^2*x^2+1)^(1/2)-63/256*c*x*(-c
^2*x^2+1)^(1/2)+63/256*arcsin(c*x))-3/8*c^2*d*e^2*(-1/8*c^7*x^7*(-c^2*x^2+1
)^(1/2)-7/48*c^5*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^3*(-c^2*x^2+1)^(1/2)-3
5/128*c*x*(-c^2*x^2+1)^(1/2)+35/128*arcsin(c*x))-1/2*c^4*d^2*e*(-1/6*c^5*x^
5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^
(1/2)+5/16*arcsin(c*x))-1/4*d^3*c^6*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*
x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))))
```

Maxima [A] time = 1.48915, size = 639, normalized size = 1.68

$$\frac{1}{10}\,ae^3x^{10}+\frac{3}{8}\,ade^2x^8+\frac{1}{2}\,ad^2ex^6+\frac{1}{4}\,ad^3x^4+\frac{1}{32}\left(8\,x^4\arcsin(cx)+\left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\,\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^4}\cdots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/10*a*e^3*x^10 + 3/8*a*d*e^2*x^8 + 1/2*a*d^2*e*x^6 + 1/4*a*d^3*x^4 + 1/32*
(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x
/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4))*c)*b*d^3 + 1/96*(48*x^6*a
rcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4
+ 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^6))
```

```
*c)*b*d^2*e + 1/1024*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2
+ 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(
-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^8))*c)*b*d*e
^2 + 1/12800*(1280*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 + 144
*sqrt(-c^2*x^2 + 1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(-c^
2*x^2 + 1)*x^3/c^8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c^2*x/sqrt(
c^2))/(sqrt(c^2)*c^10))*c)*b*e^3
```

Fricas [A] time = 2.21083, size = 776, normalized size = 2.04

$$\frac{7680\,ac^{10}e^3x^{10} + 28800\,ac^{10}de^2x^8 + 38400\,ac^{10}d^2ex^6 + 19200\,ac^{10}d^3x^4 + 15\left(512\,bc^{10}e^3x^{10} + 1920\,bc^{10}de^2x^8 + 2560\,b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/76800*(7680*a*c^10*e^3*x^10 + 28800*a*c^10*d*e^2*x^8 + 38400*a*c^10*d^2*e
*x^6 + 19200*a*c^10*d^3*x^4 + 15*(512*b*c^10*e^3*x^10 + 1920*b*c^10*d*e^2*x
^8 + 2560*b*c^10*d^2*e*x^6 + 1280*b*c^10*d^3*x^4 - 480*b*c^6*d^3 - 800*b*c^
4*d^2*e - 525*b*c^2*d*e^2 - 126*b*e^3)*arcsin(c*x) + (768*b*c^9*e^3*x^9 + 1
44*(25*b*c^9*d*e^2 + 6*b*c^7*e^3)*x^7 + 8*(800*b*c^9*d^2*e + 525*b*c^7*d*e^
2 + 126*b*c^5*e^3)*x^5 + 10*(480*b*c^9*d^3 + 800*b*c^7*d^2*e + 525*b*c^5*d*
e^2 + 126*b*c^3*e^3)*x^3 + 15*(480*b*c^7*d^3 + 800*b*c^5*d^2*e + 525*b*c^3*
d*e^2 + 126*b*c*e^3)*x)*sqrt(-c^2*x^2 + 1))/c^10
```

Sympy [A] time = 46.39, size = 597, normalized size = 1.57

$$\begin{cases} \frac{ad^3x^4}{4} + \frac{ad^2ex^6}{2} + \frac{3ade^2x^8}{8} + \frac{ae^3x^{10}}{10} + \frac{bd^3x^4\operatorname{asin}(cx)}{4} + \frac{bd^2ex^6\operatorname{asin}(cx)}{2} + \frac{3bde^2x^8\operatorname{asin}(cx)}{8} + \frac{be^3x^{10}\operatorname{asin}(cx)}{10} + \frac{bd^3x^3\sqrt{-c^2x^2+1}}{16c} + \frac{bd^2ex^5\sqrt{}}{1} \\ a\left(\frac{d^3x^4}{4} + \frac{d^2ex^6}{2} + \frac{3de^2x^8}{8} + \frac{e^3x^{10}}{10}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**4/4 + a*d**2*e*x**6/2 + 3*a*d*e**2*x**8/8 + a*e**3*x**
10/10 + b*d**3*x**4*asin(c*x)/4 + b*d**2*e*x**6*asin(c*x)/2 + 3*b*d*e**2*x*
*8*asin(c*x)/8 + b*e**3*x**10*asin(c*x)/10 + b*d**3*x**3*sqrt(-c**2*x**2 +
1)/(16*c) + b*d**2*e*x**5*sqrt(-c**2*x**2 + 1)/(12*c) + 3*b*d*e**2*x**7*sqr
t(-c**2*x**2 + 1)/(64*c) + b*e**3*x**9*sqrt(-c**2*x**2 + 1)/(100*c) + 3*b*d
**3*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*d**2*e*x**3*sqrt(-c**2*x**2 + 1)
/(48*c**3) + 7*b*d*e**2*x**5*sqrt(-c**2*x**2 + 1)/(128*c**3) + 9*b*e**3*x**
7*sqrt(-c**2*x**2 + 1)/(800*c**3) - 3*b*d**3*asin(c*x)/(32*c**4) + 5*b*d**2
*e*x*sqrt(-c**2*x**2 + 1)/(32*c**5) + 35*b*d*e**2*x**3*sqrt(-c**2*x**2 + 1)
/(512*c**5) + 21*b*e**3*x**5*sqrt(-c**2*x**2 + 1)/(1600*c**5) - 5*b*d**2*e*
asin(c*x)/(32*c**6) + 105*b*d*e**2*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) + 21*
b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(1280*c**7) - 105*b*d*e**2*asin(c*x)/(1024
*c**8) + 63*b*e**3*x*sqrt(-c**2*x**2 + 1)/(2560*c**9) - 63*b*e**3*asin(c*x)
/(2560*c**10), Ne(c, 0)), (a*(d**3*x**4/4 + d**2*e*x**6/2 + 3*d*e**2*x**8/8
 + e**3*x**10/10), True))
```

Giac [B] time = 1.32868, size = 1386, normalized size = 3.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/16*(-c^2*x^2 + 1)^(3/2)*b*d^3*x/c^3 + 1/4*(c^2*x^2 - 1)^2*b*d^3*arcsin(c
*x)/c^4 + 5/32*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 1/12*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b*d^2*x*e/c^5 + 1/4*(c^2*x^2 - 1)^2*a*d^3/c^4 + 1/2*(c^2*x^2 -
 1)*b*d^3*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^3*b*d^2*arcsin(c*x)*e/c^6 - 1
3/48*(-c^2*x^2 + 1)^(3/2)*b*d^2*x*e/c^5 + 1/2*(c^2*x^2 - 1)*a*d^3/c^4 + 5/3
2*b*d^3*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^3*a*d^2*e/c^6 + 3/2*(c^2*x^2 -
1)^2*b*d^2*arcsin(c*x)*e/c^6 + 3/64*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*
x*e^2/c^7 + 11/32*sqrt(-c^2*x^2 + 1)*b*d^2*x*e/c^5 + 3/8*(c^2*x^2 - 1)^4*b*
d*arcsin(c*x)*e^2/c^8 + 3/2*(c^2*x^2 - 1)^2*a*d^2*e/c^6 + 3/2*(c^2*x^2 - 1)
*b*d^2*arcsin(c*x)*e/c^6 + 25/128*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*x*
e^2/c^7 + 3/8*(c^2*x^2 - 1)^4*a*d*e^2/c^8 + 3/2*(c^2*x^2 - 1)^3*b*d*arcsin(
c*x)*e^2/c^8 + 3/2*(c^2*x^2 - 1)*a*d^2*e/c^6 + 11/32*b*d^2*arcsin(c*x)*e/c^
6 + 1/100*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*x*e^3/c^9 - 163/512*(-c^2*x^
2 + 1)^(3/2)*b*d*x*e^2/c^7 + 1/10*(c^2*x^2 - 1)^5*b*arcsin(c*x)*e^3/c^10 +
3/2*(c^2*x^2 - 1)^3*a*d*e^2/c^8 + 9/4*(c^2*x^2 - 1)^2*b*d*arcsin(c*x)*e^2/c
^8 + 41/800*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*x*e^3/c^9 + 279/1024*sqrt(
-c^2*x^2 + 1)*b*d*x*e^2/c^7 + 1/10*(c^2*x^2 - 1)^5*a*e^3/c^10 + 1/2*(c^2*x^
2 - 1)^4*b*arcsin(c*x)*e^3/c^10 + 9/4*(c^2*x^2 - 1)^2*a*d*e^2/c^8 + 3/2*(c^
2*x^2 - 1)*b*d*arcsin(c*x)*e^2/c^8 + 171/1600*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
 + 1)*b*x*e^3/c^9 + 1/2*(c^2*x^2 - 1)^4*a*e^3/c^10 + (c^2*x^2 - 1)^3*b*arcs
in(c*x)*e^3/c^10 + 3/2*(c^2*x^2 - 1)*a*d*e^2/c^8 + 279/1024*b*d*arcsin(c*x)
*e^2/c^8 - 149/1280*(-c^2*x^2 + 1)^(3/2)*b*x*e^3/c^9 + (c^2*x^2 - 1)^3*a*e^
3/c^10 + (c^2*x^2 - 1)^2*b*arcsin(c*x)*e^3/c^10 + 193/2560*sqrt(-c^2*x^2 +
1)*b*x*e^3/c^9 + (c^2*x^2 - 1)^2*a*e^3/c^10 + 1/2*(c^2*x^2 - 1)*b*arcsin(c*
x)*e^3/c^10 + 1/2*(c^2*x^2 - 1)*a*e^3/c^10 + 193/2560*b*arcsin(c*x)*e^3/c^1
0
```

3.616 $\int x^2 \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=287

$$\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^3x^9\left(a+b\sin^{-1}(cx)\right)+\frac{be\left(1-c^2x\right.}{}$$

```
[Out] (b*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c^2*d*e^2 + 35*e^3)*Sqrt[1 - c^2*x^2]
)/(315*c^9) - (b*(105*c^6*d^3 + 378*c^4*d^2*e + 405*c^2*d*e^2 + 140*e^3)*(1
 - c^2*x^2)^(3/2))/(945*c^9) + (b*e*(63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1
- c^2*x^2)^(5/2))/(525*c^9) - (b*e^2*(27*c^2*d + 28*e)*(1 - c^2*x^2)^(7/2))
/(441*c^9) + (b*e^3*(1 - c^2*x^2)^(9/2))/(81*c^9) + (d^3*x^3*(a + b*ArcSin[
c*x]))/3 + (3*d^2*e*x^5*(a + b*ArcSin[c*x]))/5 + (3*d*e^2*x^7*(a + b*ArcSin
[c*x]))/7 + (e^3*x^9*(a + b*ArcSin[c*x]))/9
```

Rubi [A] time = 0.373168, antiderivative size = 287, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {270, 4731, 12, 1799, 1620}

$$\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^3x^9\left(a+b\sin^{-1}(cx)\right)+\frac{be\left(1-c^2x\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c^2*d*e^2 + 35*e^3)*Sqrt[1 - c^2*x^2]
)/(315*c^9) - (b*(105*c^6*d^3 + 378*c^4*d^2*e + 405*c^2*d*e^2 + 140*e^3)*(1
 - c^2*x^2)^(3/2))/(945*c^9) + (b*e*(63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1
- c^2*x^2)^(5/2))/(525*c^9) - (b*e^2*(27*c^2*d + 28*e)*(1 - c^2*x^2)^(7/2))
/(441*c^9) + (b*e^3*(1 - c^2*x^2)^(9/2))/(81*c^9) + (d^3*x^3*(a + b*ArcSin[
c*x]))/3 + (3*d^2*e*x^5*(a + b*ArcSin[c*x]))/5 + (3*d*e^2*x^7*(a + b*ArcSin
[c*x]))/7 + (e^3*x^9*(a + b*ArcSin[c*x]))/9
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rubi steps

$$\int x^2 \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\sin^{-1}(cx)\right)+\ldots$$

$$= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\sin^{-1}(cx)\right)+\ldots$$

$$= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\sin^{-1}(cx)\right)+\ldots$$

$$= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\sin^{-1}(cx)\right)+\ldots$$

$$= \frac{b\left(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3\right)\sqrt{1-c^2x^2}}{315c^9}-\frac{b\left(105c^6d^3+378c^4d^2e+4\ldots\right.}{9\ldots}$$

Mathematica [A] time = 0.226405, size = 231, normalized size = 0.8

$$\frac{315ax^3\left(189d^2ex^2+105d^3+135de^2x^4+35e^3x^6\right)+\frac{b\sqrt{1-c^2x^2}\left(c^8\left(11907d^2ex^4+11025d^3x^2+6075de^2x^6+1225e^3x^8\right)+2c^6\left(7938d^2ex^2+11025d^3+36\ldots\right.\right.}{c^9}\ldots}{9\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x^3*(105*d^3 + 189*d^2*e*x^2 + 135*d*e^2*x^4 + 35*e^3*x^6) + (b*Sqrt
[1 - c^2*x^2]*(4480*e^3 + 80*c^2*e^2*(243*d + 28*e*x^2) + 24*c^4*e*(1323*d^
2 + 405*d*e*x^2 + 70*e^2*x^4) + 2*c^6*(11025*d^3 + 7938*d^2*e*x^2 + 3645*d*
e^2*x^4 + 700*e^3*x^6) + c^8*(11025*d^3*x^2 + 11907*d^2*e*x^4 + 6075*d*e^2*
x^6 + 1225*e^3*x^8)))/c^9 + 315*b*x^3*(105*d^3 + 189*d^2*e*x^2 + 135*d*e^2*
x^4 + 35*e^3*x^6)*ArcSin[c*x])/99225
```

Maple [A] time = 0.006, size = 417, normalized size = 1.5

$$\frac{1}{c^3}\left(\frac{a}{c^6}\left(\frac{e^3c^9x^9}{9}+\frac{3\,c^9de^2x^7}{7}+\frac{3\,c^9d^2ex^5}{5}+\frac{d^3c^9x^3}{3}\right)+\frac{b}{c^6}\left(\frac{\arcsin(cx)\,e^3c^9x^9}{9}+\frac{3\,\arcsin(cx)\,c^9de^2x^7}{7}+\frac{3\,\arcsin(cx)\,c^9d^2\ldots}{5}\ldots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^3*(a/c^6*(1/9*e^3*c^9*x^9+3/7*c^9*d*e^2*x^7+3/5*c^9*d^2*e*x^5+1/3*d^3*c
^9*x^3)+b/c^6*(1/9*arcsin(c*x)*e^3*c^9*x^9+3/7*arcsin(c*x)*c^9*d*e^2*x^7+3/
5*arcsin(c*x)*c^9*d^2*e*x^5+1/3*arcsin(c*x)*d^3*c^9*x^3-1/9*e^3*(-1/9*c^8*x
^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*x^4*(-c^2*
x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+1)^(1/2))-
3/7*c^2*d*e^2*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1
/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-3/5*c^4*d^2*e
*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^
2*x^2+1)^(1/2))-1/3*d^3*c^6*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+
1)^(1/2))))
```

Maxima [A] time = 1.47401, size = 518, normalized size = 1.8

$$\frac{1}{9}ae^3x^9+\frac{3}{7}ade^2x^7+\frac{3}{5}ad^2ex^5+\frac{1}{3}ad^3x^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3+\frac{1}{25}\left(15x^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*e^3*x^9 + 3/7*a*d*e^2*x^7 + 3/5*a*d^2*e*x^5 + 1/3*a*d^3*x^3 + 1/9*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)
)*b*d^3 + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt
(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^2*e + 3/245*(35*x
^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c
^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d*e^2 +
 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^
2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*
x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*e^3
```

Fricas [A] time = 2.06325, size = 679, normalized size = 2.37

$$\frac{11025\,ac^9e^3x^9+42525\,ac^9de^2x^7+59535\,ac^9d^2ex^5+33075\,ac^9d^3x^3+315\left(35\,bc^9e^3x^9+135\,bc^9de^2x^7+189\,bc^9d^2ex^5\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*e^3*x^9 + 42525*a*c^9*d*e^2*x^7 + 59535*a*c^9*d^2*e*x^
5 + 33075*a*c^9*d^3*x^3 + 315*(35*b*c^9*e^3*x^9 + 135*b*c^9*d*e^2*x^7 + 189
*b*c^9*d^2*e*x^5 + 105*b*c^9*d^3*x^3)*arcsin(c*x) + (1225*b*c^8*e^3*x^8 + 2
2050*b*c^6*d^3 + 31752*b*c^4*d^2*e + 25*(243*b*c^8*d*e^2 + 56*b*c^6*e^3)*x^
6 + 19440*b*c^2*d*e^2 + 3*(3969*b*c^8*d^2*e + 2430*b*c^6*d*e^2 + 560*b*c^4*
e^3)*x^4 + 4480*b*e^3 + (11025*b*c^8*d^3 + 15876*b*c^6*d^2*e + 9720*b*c^4*d
*e^2 + 2240*b*c^2*e^3)*x^2)*sqrt(-c^2*x^2 + 1))/c^9
```

Sympy [A] time = 24.8269, size = 525, normalized size = 1.83

$$\begin{cases}\frac{ad^3x^3}{3}+\frac{3ad^2ex^5}{5}+\frac{3ade^2x^7}{7}+\frac{ae^3x^9}{9}+\frac{bd^3x^3\operatorname{asin}(cx)}{3}+\frac{3bd^2ex^5\operatorname{asin}(cx)}{5}+\frac{3bde^2x^7\operatorname{asin}(cx)}{7}+\frac{be^3x^9\operatorname{asin}(cx)}{9}+\frac{bd^3x^2\sqrt{-c^2x^2+1}}{9c}+\frac{3bd^2ex^4}{} \\ a\left(\frac{d^3x^3}{3}+\frac{3d^2ex^5}{5}+\frac{3de^2x^7}{7}+\frac{e^3x^9}{9}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**3/3 + 3*a*d**2*e*x**5/5 + 3*a*d*e**2*x**7/7 + a*e**3*x
**9/9 + b*d**3*x**3*asin(c*x)/3 + 3*b*d**2*e*x**5*asin(c*x)/5 + 3*b*d*e**2*
x**7*asin(c*x)/7 + b*e**3*x**9*asin(c*x)/9 + b*d**3*x**2*sqrt(-c**2*x**2 +
1)/(9*c) + 3*b*d**2*e*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 3*b*d*e**2*x**6*sq
rt(-c**2*x**2 + 1)/(49*c) + b*e**3*x**8*sqrt(-c**2*x**2 + 1)/(81*c) + 2*b*d
**3*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(2
5*c**3) + 18*b*d*e**2*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) + 8*b*e**3*x**6*
sqrt(-c**2*x**2 + 1)/(567*c**3) + 8*b*d**2*e*sqrt(-c**2*x**2 + 1)/(25*c**5)
 + 24*b*d*e**2*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**3*x**4*sqrt(-
c**2*x**2 + 1)/(945*c**5) + 48*b*d*e**2*sqrt(-c**2*x**2 + 1)/(245*c**7) + 6
4*b*e**3*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e**3*sqrt(-c**2*x**2
 + 1)/(2835*c**9), Ne(c, 0)), (a*(d**3*x**3/3 + 3*d**2*e*x**5/5 + 3*d*e**2*
x**7/7 + e**3*x**9/9), True))
```

Giac [B] time = 1.28987, size = 942, normalized size = 3.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*x^9*e^3 + 3/7*a*d*x^7*e^2 + 3/5*a*d^2*x^5*e + 1/3*a*d^3*x^3 + 1/3*(c^
2*x^2 - 1)*b*d^3*x*arcsin(c*x)/c^2 + 1/3*b*d^3*x*arcsin(c*x)/c^2 + 3/5*(c^2
*x^2 - 1)^2*b*d^2*x*arcsin(c*x)*e/c^4 + 6/5*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*
x)*e/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^3 + 3/7*(c^2*x^2 - 1)^3*b*d*x*a
rcsin(c*x)*e^2/c^6 + 3/5*b*d^2*x*arcsin(c*x)*e/c^4 + 1/3*sqrt(-c^2*x^2 + 1)
*b*d^3/c^3 + 3/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2*e/c^5 + 9/7*(c^2
*x^2 - 1)^2*b*d*x*arcsin(c*x)*e^2/c^6 - 2/5*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^
5 + 1/9*(c^2*x^2 - 1)^4*b*x*arcsin(c*x)*e^3/c^8 + 9/7*(c^2*x^2 - 1)*b*d*x*a
rcsin(c*x)*e^2/c^6 + 3/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^7 +
3/5*sqrt(-c^2*x^2 + 1)*b*d^2*e/c^5 + 4/9*(c^2*x^2 - 1)^3*b*x*arcsin(c*x)*e^
3/c^8 + 3/7*b*d*x*arcsin(c*x)*e^2/c^6 + 9/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
+ 1)*b*d*e^2/c^7 + 2/3*(c^2*x^2 - 1)^2*b*x*arcsin(c*x)*e^3/c^8 + 1/81*(c^2*
x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^3/c^9 - 3/7*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/
c^7 + 4/9*(c^2*x^2 - 1)*b*x*arcsin(c*x)*e^3/c^8 + 4/63*(c^2*x^2 - 1)^3*sqrt
(-c^2*x^2 + 1)*b*e^3/c^9 + 3/7*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^7 + 1/9*b*x*arc
sin(c*x)*e^3/c^8 + 2/15*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3/c^9 - 4/27
*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^9 + 1/9*sqrt(-c^2*x^2 + 1)*b*e^3/c^9
```

3.617 $\int x\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=258

$$\frac{\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e}+\frac{bx\sqrt{1-c^2x^2}\left(104c^4d^2+104c^2de+35e^2\right)\left(d+ex^2\right)}{1536c^5}+\frac{5bx\sqrt{1-c^2x^2}\left(2c^2d+e\right)\left(40c^4d^2\right.}{3072c^7}$$

```
[Out] (5*b*(2*c^2*d + e)*(40*c^4*d^2 + 40*c^2*d*e + 21*e^2)*x*Sqrt[1 - c^2*x^2])/
(3072*c^7) + (b*(104*c^4*d^2 + 104*c^2*d*e + 35*e^2)*x*Sqrt[1 - c^2*x^2]*(d
 + e*x^2))/(1536*c^5) + (7*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^
2)/(384*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^3)/(64*c) - (b*(128*c^8*d
^4 + 256*c^6*d^3*e + 288*c^4*d^2*e^2 + 160*c^2*d*e^3 + 35*e^4)*ArcSin[c*x])
/(1024*c^8*e) + ((d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e)
```

Rubi [A] time = 0.267678, antiderivative size = 258, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4729, 416, 528, 388, 216}

$$\frac{\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e}+\frac{bx\sqrt{1-c^2x^2}\left(104c^4d^2+104c^2de+35e^2\right)\left(d+ex^2\right)}{1536c^5}+\frac{5bx\sqrt{1-c^2x^2}\left(2c^2d+e\right)\left(40c^4d^2\right.}{3072c^7}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*(2*c^2*d + e)*(40*c^4*d^2 + 40*c^2*d*e + 21*e^2)*x*Sqrt[1 - c^2*x^2])/
(3072*c^7) + (b*(104*c^4*d^2 + 104*c^2*d*e + 35*e^2)*x*Sqrt[1 - c^2*x^2]*(d
 + e*x^2))/(1536*c^5) + (7*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^
2)/(384*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^3)/(64*c) - (b*(128*c^8*d
^4 + 256*c^6*d^3*e + 288*c^4*d^2*e^2 + 160*c^2*d*e^3 + 35*e^4)*ArcSin[c*x])
/(1024*c^8*e) + ((d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e)
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 416

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(d*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1))/(b*(n*(p + q) + 1)),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
```

```
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int x\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)dx=\frac{\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^4}{\sqrt{1-c^2x^2}}dx}{8e}$$

$$=\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^3}{64c}+\frac{\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e}+\frac{b\int\frac{\left(d+ex^2\right)^2\left(-d\left(8c^2d+e\right)-7e(2c\right.}{\sqrt{1-c^2x^2}}}{64ce}$$

$$=\frac{7b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{384c^3}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^3}{64c}+\frac{\left(d+ex^2\right)^4\left(a+b\right.}{8e}$$

$$=\frac{b\left(104c^4d^2+104c^2de+35e^2\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{1536c^5}+\frac{7b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\left(d\right.}{384c^3}$$

$$=\frac{5b\left(2c^2d+e\right)\left(40c^4d^2+40c^2de+21e^2\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b\left(104c^4d^2+104c^2de+35e^2\right.}{1536c^5}$$

$$=\frac{5b\left(2c^2d+e\right)\left(40c^4d^2+40c^2de+21e^2\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b\left(104c^4d^2+104c^2de+35e^2\right.}{1536c^5}$$

Mathematica [A] time = 0.199539, size = 232, normalized size = 0.9

$$cx\left(384ac^7x\left(6d^2ex^2+4d^3+4de^2x^4+e^3x^6\right)+b\sqrt{1-c^2x^2}\left(16c^6\left(36d^2ex^2+48d^3+16de^2x^4+3e^3x^6\right)+8c^4e\left(108d^2+40d\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(384*a*c^7*x*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^2*x^4 + e^3*x^6) + b*Sqrt[1
- c^2*x^2]*(105*e^3 + 10*c^2*e^2*(48*d + 7*e*x^2) + 8*c^4*e*(108*d^2 + 40*d
*e*x^2 + 7*e^2*x^4) + 16*c^6*(48*d^3 + 36*d^2*e*x^2 + 16*d*e^2*x^4 + 3*e^3*
x^6))) + 3*b*(-256*c^6*d^3 - 288*c^4*d^2*e - 160*c^2*d*e^2 - 35*e^3 + 128*c
^8*(4*d^3*x^2 + 6*d^2*e*x^4 + 4*d*e^2*x^6 + e^3*x^8))*ArcSin[c*x])/(3072*c^
8)
```

Maple [A] time = 0.005, size = 369, normalized size = 1.4

$$\frac{1}{c^2}\left(\frac{a}{c^6}\left(\frac{e^3c^8x^8}{8}+\frac{c^8de^2x^6}{2}+\frac{3\,c^8d^2ex^4}{4}+\frac{x^2c^8d^3}{2}\right)+\frac{b}{c^6}\left(\frac{\arcsin(cx)\,e^3c^8x^8}{8}+\frac{\arcsin(cx)\,c^8de^2x^6}{2}+\frac{3\arcsin(cx)\,c^8d^2ex^4}{4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c^2*(a/c^6*(1/8*e^3*c^8*x^8+1/2*c^8*d*e^2*x^6+3/4*c^8*d^2*e*x^4+1/2*x^2*c
^8*d^3)+b/c^6*(1/8*arcsin(c*x)*e^3*c^8*x^8+1/2*arcsin(c*x)*c^8*d*e^2*x^6+3/
4*arcsin(c*x)*c^8*d^2*e*x^4+1/2*arcsin(c*x)*d^3*c^8*x^2-1/8*e^3*(-1/8*c^7*x
^7*(-c^2*x^2+1)^(1/2)-7/48*c^5*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^3*(-c^2*
x^2+1)^(1/2)-35/128*c*x*(-c^2*x^2+1)^(1/2)+35/128*arcsin(c*x))-1/2*c^2*d*e^
2*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x
*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-3/4*c^4*d^2*e*(-1/4*c^3*x^3*(-c^2*x^2
+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-1/2*d^3*c^6*(-1/2*c*x
*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

Maxima [A] time = 1.48887, size = 529, normalized size = 2.05

$$\frac{1}{8}ae^3x^8+\frac{1}{2}ade^2x^6+\frac{3}{4}ad^2ex^4+\frac{1}{2}ad^3x^2+\frac{1}{4}\left(2x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin\left(\frac{c^2x}{\sqrt{c^2}}\right)}{\sqrt{c^2}c^2}\right)\right)bd^3+\frac{3}{32}\left(8x^4\,\mathrm{arc}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*e^3*x^8 + 1/2*a*d*e^2*x^6 + 3/4*a*d^2*e*x^4 + 1/2*a*d^3*x^2 + 1/4*(2*
x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c^2*x/sqrt(c^2))/(sq
rt(c^2)*c^2)))*b*d^3 + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/
c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c^2*x/sqrt(c^2))/(sqrt(c^2)*c^4
))*c)*b*d^2*e + 1/96*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 +
10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c^2
*x/sqrt(c^2))/(sqrt(c^2)*c^6))*c)*b*d*e^2 + 1/3072*(384*x^8*arcsin(c*x) + (
48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^
2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c^2*x/sqrt(c
^2))/(sqrt(c^2)*c^8))*c)*b*e^3
```

Fricas [A] time = 2.15815, size = 636, normalized size = 2.47

$$\frac{384\,ac^8e^3x^8+1536\,ac^8de^2x^6+2304\,ac^8d^2ex^4+1536\,ac^8d^3x^2+3\left(128\,bc^8e^3x^8+512\,bc^8de^2x^6+768\,bc^8d^2ex^4+512\,bc\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3072*(384*a*c^8*e^3*x^8 + 1536*a*c^8*d*e^2*x^6 + 2304*a*c^8*d^2*e*x^4 + 1
536*a*c^8*d^3*x^2 + 3*(128*b*c^8*e^3*x^8 + 512*b*c^8*d*e^2*x^6 + 768*b*c^8*
d^2*e*x^4 + 512*b*c^8*d^3*x^2 - 256*b*c^6*d^3 - 288*b*c^4*d^2*e - 160*b*c^2
*d*e^2 - 35*b*e^3)*arcsin(c*x) + (48*b*c^7*e^3*x^7 + 8*(32*b*c^7*d*e^2 + 7*
b*c^5*e^3)*x^5 + 2*(288*b*c^7*d^2*e + 160*b*c^5*d*e^2 + 35*b*c^3*e^3)*x^3 +
 3*(256*b*c^7*d^3 + 288*b*c^5*d^2*e + 160*b*c^3*d*e^2 + 35*b*c*e^3)*x)*sqrt
(-c^2*x^2 + 1))/c^8
```

Sympy [A] time = 16.9054, size = 483, normalized size = 1.87

$$\begin{cases} \frac{ad^3x^2}{2} + \frac{3ad^2ex^4}{4} + \frac{ade^2x^6}{2} + \frac{ae^3x^8}{8} + \frac{bd^3x^2\operatorname{asin}(cx)}{2} + \frac{3bd^2ex^4\operatorname{asin}(cx)}{4} + \frac{bde^2x^6\operatorname{asin}(cx)}{2} + \frac{be^3x^8\operatorname{asin}(cx)}{8} + \frac{bd^3x\sqrt{-c^2x^2+1}}{4c} + \frac{3bd^2ex^3\sqrt{-c^2x^2}}{16c} \\ a\left(\frac{d^3x^2}{2} + \frac{3d^2ex^4}{4} + \frac{de^2x^6}{2} + \frac{e^3x^8}{8}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**2/2 + 3*a*d**2*e*x**4/4 + a*d*e**2*x**6/2 + a*e**3*x**
8/8 + b*d**3*x**2*asin(c*x)/2 + 3*b*d**2*e*x**4*asin(c*x)/4 + b*d*e**2*x**6
*asin(c*x)/2 + b*e**3*x**8*asin(c*x)/8 + b*d**3*x*sqrt(-c**2*x**2 + 1)/(4*c
) + 3*b*d**2*e*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*d*e**2*x**5*sqrt(-c**2*
x**2 + 1)/(12*c) + b*e**3*x**7*sqrt(-c**2*x**2 + 1)/(64*c) - b*d**3*asin(c*
x)/(4*c**2) + 9*b*d**2*e*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*d*e**2*x**3
*sqrt(-c**2*x**2 + 1)/(48*c**3) + 7*b*e**3*x**5*sqrt(-c**2*x**2 + 1)/(384*c
**3) - 9*b*d**2*e*asin(c*x)/(32*c**4) + 5*b*d*e**2*x*sqrt(-c**2*x**2 + 1)/(
32*c**5) + 35*b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(1536*c**5) - 5*b*d*e**2*asi
n(c*x)/(32*c**6) + 35*b*e**3*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) - 35*b*e**3
*asin(c*x)/(1024*c**8), Ne(c, 0)), (a*(d**3*x**2/2 + 3*d**2*e*x**4/4 + d*e*
*2*x**6/2 + e**3*x**8/8), True))
```

Giac [B] time = 1.23898, size = 987, normalized size = 3.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*x/c + 1/2*(c^2*x^2 - 1)*b*d^3*arcsin(c*x)/c^2
 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d^2*x*e/c^3 + 1/2*(c^2*x^2 - 1)*a*d^3/c^2 + 1
/4*b*d^3*arcsin(c*x)/c^2 + 3/4*(c^2*x^2 - 1)^2*b*d^2*arcsin(c*x)*e/c^4 + 15
/32*sqrt(-c^2*x^2 + 1)*b*d^2*x*e/c^3 + 3/4*(c^2*x^2 - 1)^2*a*d^2*e/c^4 + 3/
2*(c^2*x^2 - 1)*b*d^2*arcsin(c*x)*e/c^4 + 1/12*(c^2*x^2 - 1)^2*sqrt(-c^2*x^
2 + 1)*b*d*x*e^2/c^5 + 1/2*(c^2*x^2 - 1)^3*b*d*arcsin(c*x)*e^2/c^6 + 3/2*(c
^2*x^2 - 1)*a*d^2*e/c^4 + 15/32*b*d^2*arcsin(c*x)*e/c^4 - 13/48*(-c^2*x^2 +
 1)^(3/2)*b*d*x*e^2/c^5 + 1/2*(c^2*x^2 - 1)^3*a*d*e^2/c^6 + 3/2*(c^2*x^2 -
1)^2*b*d*arcsin(c*x)*e^2/c^6 + 1/64*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*x*
e^3/c^7 + 11/32*sqrt(-c^2*x^2 + 1)*b*d*x*e^2/c^5 + 1/8*(c^2*x^2 - 1)^4*b*ar
csin(c*x)*e^3/c^8 + 3/2*(c^2*x^2 - 1)^2*a*d*e^2/c^6 + 3/2*(c^2*x^2 - 1)*b*d
*arcsin(c*x)*e^2/c^6 + 25/384*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*x*e^3/c^
7 + 1/8*(c^2*x^2 - 1)^4*a*e^3/c^8 + 1/2*(c^2*x^2 - 1)^3*b*arcsin(c*x)*e^3/c
^8 + 3/2*(c^2*x^2 - 1)*a*d*e^2/c^6 + 11/32*b*d*arcsin(c*x)*e^2/c^6 - 163/15
36*(-c^2*x^2 + 1)^(3/2)*b*x*e^3/c^7 + 1/2*(c^2*x^2 - 1)^3*a*e^3/c^8 + 3/4*(
c^2*x^2 - 1)^2*b*arcsin(c*x)*e^3/c^8 + 93/1024*sqrt(-c^2*x^2 + 1)*b*x*e^3/c
^7 + 3/4*(c^2*x^2 - 1)^2*a*e^3/c^8 + 1/2*(c^2*x^2 - 1)*b*arcsin(c*x)*e^3/c^
8 + 1/2*(c^2*x^2 - 1)*a*e^3/c^8 + 93/1024*b*arcsin(c*x)*e^3/c^8
```

3.618 $\int \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=225

$$d^2ex^3\left(a+b\sin^{-1}(cx)\right)+d^3x\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(a+b\sin^{-1}(cx)\right)-\frac{be\left(1-c^2x^2\right)^{3/2}}{}$$

```
[Out] (b*(35*c^6*d^3 + 35*c^4*d^2*e + 21*c^2*d*e^2 + 5*e^3)*Sqrt[1 - c^2*x^2])/(3
5*c^7) - (b*e*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*(1 - c^2*x^2)^(3/2))/(105*
c^7) + (3*b*e^2*(7*c^2*d + 5*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^3*(1
- c^2*x^2)^(7/2))/(49*c^7) + d^3*x*(a + b*ArcSin[c*x]) + d^2*e*x^3*(a + b*A
rcSin[c*x]) + (3*d*e^2*x^5*(a + b*ArcSin[c*x]))/5 + (e^3*x^7*(a + b*ArcSin[
c*x]))/7
```

Rubi [A] time = 0.250657, antiderivative size = 225, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {194, 4665, 12, 1799, 1850}

$$d^2ex^3\left(a+b\sin^{-1}(cx)\right)+d^3x\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(a+b\sin^{-1}(cx)\right)-\frac{be\left(1-c^2x^2\right)^{3/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*(35*c^6*d^3 + 35*c^4*d^2*e + 21*c^2*d*e^2 + 5*e^3)*Sqrt[1 - c^2*x^2])/(3
5*c^7) - (b*e*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*(1 - c^2*x^2)^(3/2))/(105*
c^7) + (3*b*e^2*(7*c^2*d + 5*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^3*(1
- c^2*x^2)^(7/2))/(49*c^7) + d^3*x*(a + b*ArcSin[c*x]) + d^2*e*x^3*(a + b*A
rcSin[c*x]) + (3*d*e^2*x^5*(a + b*ArcSin[c*x]))/5 + (e^3*x^7*(a + b*ArcSin[
c*x]))/7
```


Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4665

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1850

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rubi steps

$$\int \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(\right.$$

$$= \frac{b\left(35c^6d^3+35c^4d^2e+21c^2de^2+5e^3\right)\sqrt{1-c^2x^2}}{35c^7}-\frac{be\left(35c^4d^2+42c^2de+15e^2\right)\left(1-\right.}{105c^7}$$

Mathematica [A] time = 0.244473, size = 187, normalized size = 0.83

$$\frac{105ax\left(35d^2ex^2+35d^3+21de^2x^4+5e^3x^6\right)+\frac{b\sqrt{1-c^2x^2}\left(c^6\left(1225d^2ex^2+3675d^3+441de^2x^4+75e^3x^6\right)+2c^4e\left(1225d^2+294dex^2+45e^2x^4\right)+24c^2e^2\left(49d\right.\right.}{c^7}}{3675}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (105*a*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6) + (b*Sqrt[1 - c
^2*x^2]*(240*e^3 + 24*c^2*e^2*(49*d + 5*e*x^2) + 2*c^4*e*(1225*d^2 + 294*d*
e*x^2 + 45*e^2*x^4) + c^6*(3675*d^3 + 1225*d^2*e*x^2 + 441*d*e^2*x^4 + 75*e
^3*x^6)))/c^7 + 105*b*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6)*
ArcSin[c*x])/3675
```

Maple [A] time = 0.005, size = 325, normalized size = 1.4

$$\frac{1}{c}\left(\frac{a}{c^6}\left(\frac{e^3c^7x^7}{7}+\frac{3\,c^7de^2x^5}{5}+c^7d^2ex^3+d^3c^7x\right)+\frac{b}{c^6}\left(\frac{\arcsin(cx)\,e^3c^7x^7}{7}+\frac{3\,\arcsin(cx)\,c^7de^2x^5}{5}+\arcsin(cx)\,c^7d^2ex^3+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(a/c^6*(1/7*e^3*c^7*x^7+3/5*c^7*d*e^2*x^5+c^7*d^2*e*x^3+d^3*c^7*x)+b/c^
6*(1/7*arcsin(c*x)*e^3*c^7*x^7+3/5*arcsin(c*x)*c^7*d*e^2*x^5+arcsin(c*x)*c^
7*d^2*e*x^3+arcsin(c*x)*d^3*c^7*x-1/7*e^3*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-
6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2
*x^2+1)^(1/2))-3/5*c^2*d*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*
(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-c^4*d^2*e*(-1/3*c^2*x^2*(-c^2*x
^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+d^3*c^6*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.4679, size = 394, normalized size = 1.75

$$\frac{1}{7}ae^3x^7 + \frac{3}{5}ade^2x^5 + ad^2ex^3 + \frac{1}{3}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2e + \frac{1}{25}\left(15x^5\arcsin(cx) +\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e^3*x^7 + 3/5*a*d*e^2*x^5 + a*d^2*e*x^3 + 1/3*(3*x^3*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2*e + 1/25*(15
*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2
/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e^2 + 1/245*(35*x^7*arcsin(c*x) + (
5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x
^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*e^3 + a*d^3*x + (c*x*arcs
in(c*x) + sqrt(-c^2*x^2 + 1))*b*d^3/c
```

Fricas [A] time = 2.05662, size = 537, normalized size = 2.39

$$525\,ac^7e^3x^7 + 2205\,ac^7de^2x^5 + 3675\,ac^7d^2ex^3 + 3675\,ac^7d^3x + 105\left(5\,bc^7e^3x^7 + 21\,bc^7de^2x^5 + 35\,bc^7d^2ex^3 + 35\,bc^7d^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3675*(525*a*c^7*e^3*x^7 + 2205*a*c^7*d*e^2*x^5 + 3675*a*c^7*d^2*e*x^3 + 3
675*a*c^7*d^3*x + 105*(5*b*c^7*e^3*x^7 + 21*b*c^7*d*e^2*x^5 + 35*b*c^7*d^2*
e*x^3 + 35*b*c^7*d^3*x)*arcsin(c*x) + (75*b*c^6*e^3*x^6 + 3675*b*c^6*d^3 +
2450*b*c^4*d^2*e + 1176*b*c^2*d*e^2 + 9*(49*b*c^6*d*e^2 + 10*b*c^4*e^3)*x^4
 + 240*b*e^3 + (1225*b*c^6*d^2*e + 588*b*c^4*d*e^2 + 120*b*c^2*e^3)*x^2)*sq
rt(-c^2*x^2 + 1))/c^7
```

Sympy [A] time = 8.86437, size = 389, normalized size = 1.73

$$\begin{cases} ad^3x + ad^2ex^3 + \frac{3ade^2x^5}{5} + \frac{ae^3x^7}{7} + bd^3x\operatorname{asin}(cx) + bd^2ex^3\operatorname{asin}(cx) + \frac{3bde^2x^5\operatorname{asin}(cx)}{5} + \frac{be^3x^7\operatorname{asin}(cx)}{7} + \frac{bd^3\sqrt{-c^2x^2+1}}{c} + \frac{bd^2}{} \\ a\left(d^3x + d^2ex^3 + \frac{3de^2x^5}{5} + \frac{e^3x^7}{7}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x + a*d**2*e*x**3 + 3*a*d*e**2*x**5/5 + a*e**3*x**7/7 + b
*d**3*x*asin(c*x) + b*d**2*e*x**3*asin(c*x) + 3*b*d*e**2*x**5*asin(c*x)/5 +
 b*e**3*x**7*asin(c*x)/7 + b*d**3*sqrt(-c**2*x**2 + 1)/c + b*d**2*e*x**2*sq
rt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*
e**3*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + 2*b*d**2*e*sqrt(-c**2*x**2 + 1)/(3*
c**3) + 4*b*d*e**2*x**2*sqrt(-c**2*x**2 + 1)/(25*c**3) + 6*b*e**3*x**4*sqrt
(-c**2*x**2 + 1)/(245*c**3) + 8*b*d*e**2*sqrt(-c**2*x**2 + 1)/(25*c**5) + 8
*b*e**3*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**3*sqrt(-c**2*x**2 +
```

```
1)/(245*c**7), Ne(c, 0)), (a*(d**3*x + d**2*e*x**3 + 3*d*e**2*x**5/5 + e**3
*x**7/7), True))
```

Giac [B] time = 1.2988, size = 633, normalized size = 2.81

$$\frac{1}{7}ax^7e^3 + \frac{3}{5}adx^5e^2 + ad^2x^3e + bd^3x\arcsin{(cx)} + ad^3x + \frac{(c^2x^2-1)bd^2x\arcsin{(cx)}e}{c^2} + \frac{bd^2x\arcsin{(cx)}e}{c^2} + \frac{\sqrt{-c^2x^2+1}}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*x^7*e^3 + 3/5*a*d*x^5*e^2 + a*d^2*x^3*e + b*d^3*x*arcsin(c*x) + a*d^3
*x + (c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)*e/c^2 + b*d^2*x*arcsin(c*x)*e/c^2 +
sqrt(-c^2*x^2 + 1)*b*d^3/c + 3/5*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)*e^2/c^4
- 1/3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^3 + 6/5*(c^2*x^2 - 1)*b*d*x*arcsin(c*x
)*e^2/c^4 + sqrt(-c^2*x^2 + 1)*b*d^2*e/c^3 + 1/7*(c^2*x^2 - 1)^3*b*x*arcsin
(c*x)*e^3/c^6 + 3/5*b*d*x*arcsin(c*x)*e^2/c^4 + 3/25*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b*d*e^2/c^5 + 3/7*(c^2*x^2 - 1)^2*b*x*arcsin(c*x)*e^3/c^6 - 2/
5*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/c^5 + 3/7*(c^2*x^2 - 1)*b*x*arcsin(c*x)*e^3/
c^6 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3/c^7 + 3/5*sqrt(-c^2*x^2
 + 1)*b*d*e^2/c^5 + 1/7*b*x*arcsin(c*x)*e^3/c^6 + 3/35*(c^2*x^2 - 1)^2*sqrt
(-c^2*x^2 + 1)*b*e^3/c^7 - 1/7*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^7 + 1/7*sqrt(-c
^2*x^2 + 1)*b*e^3/c^7
```

3.619 $\int \frac{(d+ex^2)^3 (a+b\sin^{-1}(cx))}{x} dx$

Optimal. Leaf size=357

$$-\frac{1}{2}ibd^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{3}{2}d^2ex^2\left(a+b\sin^{-1}(cx)\right)+d^3\log(x)\left(a+b\sin^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\sin^{-1}(cx)\right)+$$

```
[Out] (3*b*d^2*e*x*Sqrt[1 - c^2*x^2])/(4*c) + (9*b*d*e^2*x*Sqrt[1 - c^2*x^2])/(32
*c^3) + (5*b*e^3*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (3*b*d*e^2*x^3*Sqrt[1 - c^
2*x^2])/(16*c) + (5*b*e^3*x^3*Sqrt[1 - c^2*x^2])/(144*c^3) + (b*e^3*x^5*Sqr
t[1 - c^2*x^2])/(36*c) - (3*b*d^2*e*ArcSin[c*x])/(4*c^2) - (9*b*d*e^2*ArcSi
n[c*x])/(32*c^4) - (5*b*e^3*ArcSin[c*x])/(96*c^6) - (I/2)*b*d^3*ArcSin[c*x]
^2 + (3*d^2*e*x^2*(a + b*ArcSin[c*x]))/2 + (3*d*e^2*x^4*(a + b*ArcSin[c*x])
)/4 + (e^3*x^6*(a + b*ArcSin[c*x]))/6 + b*d^3*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] - b*d^3*ArcSin[c*x]*Log[x] + d^3*(a + b*ArcSin[c*x])*Log[x] -
 (I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.475611, antiderivative size = 357, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {266, 43, 4731, 12, 6742, 321, 216, 2326, 4625, 3717, 2190, 2279, 2391}

$$-\frac{1}{2}ibd^3\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+\frac{3}{2}d^2ex^2\left(a+b\sin^{-1}(cx)\right)+d^3\log(x)\left(a+b\sin^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\sin^{-1}(cx)\right)+$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```


```
[Out] (3*b*d^2*e*x*Sqrt[1 - c^2*x^2])/(4*c) + (9*b*d*e^2*x*Sqrt[1 - c^2*x^2])/(32
*c^3) + (5*b*e^3*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (3*b*d*e^2*x^3*Sqrt[1 - c^
2*x^2])/(16*c) + (5*b*e^3*x^3*Sqrt[1 - c^2*x^2])/(144*c^3) + (b*e^3*x^5*Sqr
t[1 - c^2*x^2])/(36*c) - (3*b*d^2*e*ArcSin[c*x])/(4*c^2) - (9*b*d*e^2*ArcSi
n[c*x])/(32*c^4) - (5*b*e^3*ArcSin[c*x])/(96*c^6) - (I/2)*b*d^3*ArcSin[c*x]
^2 + (3*d^2*e*x^2*(a + b*ArcSin[c*x]))/2 + (3*d*e^2*x^4*(a + b*ArcSin[c*x])
)/4 + (e^3*x^6*(a + b*ArcSin[c*x]))/6 + b*d^3*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] - b*d^3*ArcSin[c*x]*Log[x] + d^3*(a + b*ArcSin[c*x])*Log[x] -
 (I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
```

```
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = \frac{3}{2}d^2ex^2\left(a+b\sin^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a+b\sin^{-1}(cx)\right)+ a$$

$$= \frac{3}{2}d^2ex^2\left(a+b\sin^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a+b\sin^{-1}(cx)\right)+ a$$

$$= \frac{3}{2}d^2ex^2\left(a+b\sin^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a+b\sin^{-1}(cx)\right)+ a$$

$$= \frac{3}{2}d^2ex^2\left(a+b\sin^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a+b\sin^{-1}(cx)\right)+ a$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{be^3x^5\sqrt{1-c^2x^2}}{36c}+\frac{3}{2}d^2ex^2\left(a+b\sin^{-1}(c\right.$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3}+$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+$$

Mathematica [A] time = 0.371055, size = 278, normalized size = 0.78

$$-\frac{1}{2}ibd^3\left(\sin^{-1}(cx)^2+\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right)+\frac{3}{2}ad^2ex^2+ad^3\log(x)+\frac{3}{4}ade^2x^4+\frac{1}{6}ae^3x^6+\frac{3bd^2e\left(cx\sqrt{1-c^2x^2}-\right.}{4c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (3*a*d^2*e*x^2)/2 + (3*a*d*e^2*x^4)/4 + (a*e^3*x^6)/6 + (b*e^3*(c*x*Sqrt[1
- c^2*x^2]*(15 + 10*c^2*x^2 + 8*c^4*x^4) - 15*ArcSin[c*x]))/(288*c^6) + (3*
b*d*e^2*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) - 3*ArcSin[c*x]))/(32*c^4) +
 (3*b*d^2*e*(c*x*Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(4*c^2) + (3*b*d^2*e*x^2
*ArcSin[c*x])/2 + (3*b*d*e^2*x^4*ArcSin[c*x])/4 + (b*e^3*x^6*ArcSin[c*x])/6
 + b*d^3*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + a*d^3*Log[x] - (I/2)*
b*d^3*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])])
```

Maple [A] time = 0.342, size = 392, normalized size = 1.1

$$\frac{ae^3x^6}{6}+\frac{3\,ade^2x^4}{4}+\frac{3\,ad^2ex^2}{2}+d^3a\ln(cx)+\frac{be^3x^5}{36\,c}\sqrt{-c^2x^2+1}+\frac{5\,be^3x^3}{144\,c^3}\sqrt{-c^2x^2+1}+\frac{5\,be^3x}{96\,c^5}\sqrt{-c^2x^2+1}-\frac{9\,bde^2\,\mathrm{arc}}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x)
```

```
[Out] 1/6*a*e^3*x^6+3/4*a*d*e^2*x^4+3/2*a*d^2*e*x^2+d^3*a*ln(c*x)+1/36*b*e^3*x^5*
(-c^2*x^2+1)^(1/2)/c+5/144*b*e^3*x^3*(-c^2*x^2+1)^(1/2)/c^3+5/96*b*e^3*x*(-
c^2*x^2+1)^(1/2)/c^5-9/32*b*d*e^2*arcsin(c*x)/c^4-3/4*b*d^2*e*arcsin(c*x)/c
^2-1/2*I*b*d^3*arcsin(c*x)^2+1/6*b*arcsin(c*x)*e^3*x^6+3/4*b*arcsin(c*x)*d*
e^2*x^4+3/2*b*arcsin(c*x)*d^2*e*x^2-5/96*b*e^3*arcsin(c*x)/c^6-I*d^3*b*poly
log(2,-I*c*x-(-c^2*x^2+1)^(1/2))+3/16*b*d*e^2*x^3*(-c^2*x^2+1)^(1/2)/c+9/32
*b*d*e^2*x*(-c^2*x^2+1)^(1/2)/c^3+3/4*b*d^2*e*x*(-c^2*x^2+1)^(1/2)/c+d^3*b*
arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+d^3*b*arcsin(c*x)*ln(1-I*c*x-(-c
^2*x^2+1)^(1/2))-I*d^3*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{6}\,ae^3x^6 + \frac{3}{4}\,ade^2x^4 + \frac{3}{2}\,ad^2ex^2 + ad^3\log\left(x\right) + \int \frac{\left(be^3x^6 + 3\,bde^2x^4 + 3\,bd^2ex^2 + bd^3\right)\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/6*a*e^3*x^6 + 3/4*a*d*e^2*x^4 + 3/2*a*d^2*e*x^2 + a*d^3*log(x) + integrat
e((b*e^3*x^6 + 3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{ae^3x^6 + 3\,ade^2x^4 + 3\,ad^2ex^2 + ad^3 + \left(be^3x^6 + 3\,bde^2x^4 + 3\,bd^2ex^2 + bd^3\right)\arcsin\left(cx\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + b\,\mathrm{asin}\left(cx\right)\right)\left(d + ex^2\right)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**3/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^2 + d)^3 (b \arcsin(cx) + a)}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)/x, x)
```

3.620 $\int \frac{(d+ex^2)^3 (a+b\sin^{-1}(cx))}{x^2} dx$

Optimal. Leaf size=190

$$3d^2ex\left(a+b\sin^{-1}(cx)\right)-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x}+de^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{be\sqrt{1-c^2x^2}\left(15c^4d^2\right.}{5c^5}$$

```
[Out] (b*e*(15*c^4*d^2 + 5*c^2*d*e + e^2)*Sqrt[1 - c^2*x^2])/(5*c^5) - (b*e^2*(5*
c^2*d + 2*e)*(1 - c^2*x^2)^(3/2))/(15*c^5) + (b*e^3*(1 - c^2*x^2)^(5/2))/(2
5*c^5) - (d^3*(a + b*ArcSin[c*x]))/x + 3*d^2*e*x*(a + b*ArcSin[c*x]) + d*e^
2*x^3*(a + b*ArcSin[c*x]) + (e^3*x^5*(a + b*ArcSin[c*x]))/5 - b*c*d^3*ArcTa
nh[Sqrt[1 - c^2*x^2]]
```

Rubi [A] time = 0.271036, antiderivative size = 190, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {270, 4731, 1799, 1620, 63, 208}

$$3d^2ex\left(a+b\sin^{-1}(cx)\right)-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x}+de^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{be\sqrt{1-c^2x^2}\left(15c^4d^2\right.}{5c^5}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*(15*c^4*d^2 + 5*c^2*d*e + e^2)*Sqrt[1 - c^2*x^2])/(5*c^5) - (b*e^2*(5*
c^2*d + 2*e)*(1 - c^2*x^2)^(3/2))/(15*c^5) + (b*e^3*(1 - c^2*x^2)^(5/2))/(2
5*c^5) - (d^3*(a + b*ArcSin[c*x]))/x + 3*d^2*e*x*(a + b*ArcSin[c*x]) + d*e^
2*x^3*(a + b*ArcSin[c*x]) + (e^3*x^5*(a + b*ArcSin[c*x]))/5 - b*c*d^3*ArcTa
nh[Sqrt[1 - c^2*x^2]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
```

```
xpon[Px, x], 2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x} + 3d^2ex\left(a+b\sin^{-1}(cx)\right) + de^2x^3\left(a+b\sin^{-1}(cx)\right) + \frac{1}{5}e^3x^5$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x} + 3d^2ex\left(a+b\sin^{-1}(cx)\right) + de^2x^3\left(a+b\sin^{-1}(cx)\right) + \frac{1}{5}e^3x^5$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{x} + 3d^2ex\left(a+b\sin^{-1}(cx)\right) + de^2x^3\left(a+b\sin^{-1}(cx)\right) + \frac{1}{5}e^3x^5$$

$$= \frac{be\left(15c^4d^2+5c^2de+e^2\right)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2\left(5c^2d+2e\right)\left(1-c^2x^2\right)^{3/2}}{15c^5} + \frac{be^3\left(1-c^2x\right.}{25c^5}$$

$$= \frac{be\left(15c^4d^2+5c^2de+e^2\right)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2\left(5c^2d+2e\right)\left(1-c^2x^2\right)^{3/2}}{15c^5} + \frac{be^3\left(1-c^2x\right.}{25c^5}$$

$$= \frac{be\left(15c^4d^2+5c^2de+e^2\right)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2\left(5c^2d+2e\right)\left(1-c^2x^2\right)^{3/2}}{15c^5} + \frac{be^3\left(1-c^2x\right.}{25c^5}$$

Mathematica [A] time = 0.20232, size = 183, normalized size = 0.96

$$3ad^2ex - \frac{ad^3}{x} + ade^2x^3 + \frac{1}{5}ae^3x^5 + \frac{be\sqrt{1-c^2x^2}\left(c^4\left(225d^2+25dex^2+3e^2x^4\right)+2c^2e\left(25d+2ex^2\right)+8e^2\right)}{75c^5} - bcd^3\log\left(\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*d^3)/x) + 3*a*d^2*e*x + a*d*e^2*x^3 + (a*e^3*x^5)/5 + (b*e*Sqrt[1 - c^
2*x^2]*(8*e^2 + 2*c^2*e*(25*d + 2*e*x^2) + c^4*(225*d^2 + 25*d*e*x^2 + 3*e^
2*x^4)))/(75*c^5) + (b*(-5*d^3 + 15*d^2*e*x^2 + 5*d*e^2*x^4 + e^3*x^6)*ArcS
in[c*x])/(5*x) + b*c*d^3*Log[x] - b*c*d^3*Log[1 + Sqrt[1 - c^2*x^2]]
```

Maple [A] time = 0.01, size = 264, normalized size = 1.4

$$c\left(\frac{a}{c^6}\left(\frac{e^3c^5x^5}{5} + c^5de^2x^3 + 3c^5d^2ex - \frac{c^5d^3}{x}\right) + \frac{b}{c^6}\left(\frac{\arcsin(cx)\,e^3c^5x^5}{5} + \arcsin(cx)\,c^5de^2x^3 + 3\arcsin(cx)\,c^5d^2ex - \right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x)
```

```
[Out] c*(a/c^6*(1/5*e^3*c^5*x^5+c^5*d*e^2*x^3+3*c^5*d^2*e*x-d^3*c^5/x)+b/c^6*(1/5
*arcsin(c*x)*e^3*c^5*x^5+arcsin(c*x)*c^5*d*e^2*x^3+3*arcsin(c*x)*c^5*d^2*e*
x-arcsin(c*x)*d^3*c^5/x-1/5*e^3*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x
^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-c^2*d*e^2*(-1/3*c^2*x^2*(-c^
2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+3*c^4*d^2*e*(-c^2*x^2+1)^(1/2)-d^3*c
^6*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A] time = 1.4505, size = 325, normalized size = 1.71

$$\frac{1}{5}\,ae^3x^5 + ade^2x^3 - \left(c\log\left(\frac{2\,\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bd^3 + \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+}}{c^4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/5*a*e^3*x^5 + a*d*e^2*x^3 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)
) + arcsin(c*x)/x)*b*d^3 + 1/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e^2 + 1/75*(15*x^5*arcsin(c*x) + (3
*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^
2 + 1)/c^6)*c)*b*e^3 + 3*a*d^2*e*x + 3*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1
))*b*d^2*e/c - a*d^3/x
```

Fricas [A] time = 3.29502, size = 539, normalized size = 2.84

$$\frac{30\,ac^5e^3x^6 + 150\,ac^5de^2x^4 - 75\,bc^6d^3x\log\left(\sqrt{-c^2x^2+1}+1\right) + 75\,bc^6d^3x\log\left(\sqrt{-c^2x^2+1}-1\right) + 450\,ac^5d^2ex^2 - 150\,ac^5d}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/150*(30*a*c^5*e^3*x^6 + 150*a*c^5*d*e^2*x^4 - 75*b*c^6*d^3*x*log(sqrt(-c^
2*x^2 + 1) + 1) + 75*b*c^6*d^3*x*log(sqrt(-c^2*x^2 + 1) - 1) + 450*a*c^5*d^
2*e*x^2 - 150*a*c^5*d^3 + 30*(b*c^5*e^3*x^6 + 5*b*c^5*d*e^2*x^4 + 15*b*c^5*
d^2*e*x^2 - 5*b*c^5*d^3)*arcsin(c*x) + 2*(3*b*c^4*e^3*x^5 + (25*b*c^4*d*e^2
 + 4*b*c^2*e^3)*x^3 + (225*b*c^4*d^2*e + 50*b*c^2*d*e^2 + 8*b*e^3)*x)*sqrt(
-c^2*x^2 + 1))/(c^5*x)
```

Sympy [A] time = 9.28775, size = 272, normalized size = 1.43

$$-\frac{ad^3}{x} + 3ad^2ex + ade^2x^3 + \frac{ae^3x^5}{5} + bcd^3\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - bcde^2\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*x + a*d*e**2*x**3 + a*e**3*x**5/5 + b*c*d**3*Piecewi
se((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*
d*e**2*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 +
 1)/(3*c**4), Ne(c, 0)), (x**4/4, True)) - b*c*e**3*Piecewise((-x**4*sqrt(-
c**2*x**2 + 1)/(5*c**2) - 4*x**2*sqrt(-c**2*x**2 + 1)/(15*c**4) - 8*sqrt(-c
**2*x**2 + 1)/(15*c**6), Ne(c, 0)), (x**6/6, True))/5 - b*d**3*asin(c*x)/x
+ 3*b*d**2*e*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c
, True)) + b*d*e**2*x**3*asin(c*x) + b*e**3*x**5*asin(c*x)/5
```

Giac [B] time = 6.89549, size = 14533, normalized size = 76.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^18*d^3*x^12*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 +
5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1
)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1
) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1
/2*a*c^18*d^3*x^12/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sq
rt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*
x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6
*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) + b*c^17*d^3*x^11
*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(s
qrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^
6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - b*c^17*d^3*x^1
1*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c
^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - 3*b*
c^16*d^3*x^10*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*
x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 1
0*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) - 3*a*c^16
*d^3*x^10/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x
^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) + 5*b*c^15*d^3*x^9*log(abs
(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2
*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sq
rt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqr
t(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 5*b*c^15*d^3*x^9*log(sq
rt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/
(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^
10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 15/2*b*c^14*d
^3*x^8*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sq
rt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*
x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6
*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 3*b*c^15*d^2*x^1
1*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1
) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*
```

x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 6*b*c^14*d^2*x^10*arcsin(c*x)*
e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1)
+ 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2
 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) - 15/2*a*c^14*d^3*x^8/((c^16*x^11/
(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
+ 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^8) + 6*a*c^14*d^2*x^10*e/((c^16*x^11/(sqrt(-c^2*x^2
+ 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c
^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^10) + 10*b*c^13*d^3*x^7*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x
^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2
 + 1) + 1)^7) - 10*b*c^13*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(
sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^1
2*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sq
rt(-c^2*x^2 + 1) + 1)^7) - 10*b*c^12*d^3*x^6*arcsin(c*x)/((c^16*x^11/(sqrt(
-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7
/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^
8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c
^2*x^2 + 1) + 1)^6) - 9*b*c^13*d^2*x^9*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) +
1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2
+ 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)
^9) + 24*b*c^12*d^2*x^8*arcsin(c*x)*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^
11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1
) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^
2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8)
 - 10*a*c^12*d^3*x^6/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(
sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^1
0*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 2/3*b*c^13*d*x
^11*e^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2
 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c
^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 24*a*c^12*d^2*x^8*e/((c^16
*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 10*b*c^11*d^3*x^5*log(abs(c)*abs(x))/((c^
16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9
 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 10*b*c^11*d^3*x^5*log(sqrt(-c^2*x^2 + 1
) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2
+ 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^
2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 15/2*b*c^10*d^3*x^4*arcsin(c
*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1
) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 6*b*c^11*d^2*x^7*e/((c^16*x^11/
(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5

+ 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 36*b*c^10*d^2*x^6*arcsin(c*x)*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 15/2*a*c^10*d^3*x^4/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 10/3*b*c^11*d*x^9*e^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) + 8*b*c^10*d*x^8*arcsin(c*x)*e^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 36*a*c^10*d^2*x^6*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 5*b*c^9*d^3*x^3*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 5*b*c^9*d^3*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^8*d^3*x^2*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 8/75*b*c^11*x^11*e^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 8*a*c^10*d*x^8*e^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 6*b*c^9*d^2*x^5*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) + 24*b*c^8*d^2*x^4*arcsin(c*x)*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 3*a*c^8*d^3*x^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 8/3*b*c^9*d*x^7*e^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 16*b*c^8*d*x^6*arcsin(c*x)*e^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2

+ 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 24*a*c^8*d^2*x^4*e/((c^16*x^11/(s
qrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12
*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr
t(-c^2*x^2 + 1) + 1)^4) + b*c^7*d^3*x*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(
-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7
/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^
8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c
^2*x^2 + 1) + 1)) - b*c^7*d^3*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sq
rt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*
x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5
*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt
(-c^2*x^2 + 1) + 1)) - 1/2*b*c^6*d^3*arcsin(c*x)/(c^16*x^11/(sqrt(-c^2*x^2
+ 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c
^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1)) - 8/15*b*c^9*x^9*
e^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1
) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) + 16*a*c^8*d*x^6*e^2/((c^16*x^11/
(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
+ 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^6) + 9*b*c^7*d^2*x^3*e/((c^16*x^11/(sqrt(-c^2*x^2 +
1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt
(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
+ 1)^3) + 6*b*c^6*d^2*x^2*arcsin(c*x)*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) +
1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2
+ 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)
^2) - 1/2*a*c^6*d^3/(c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sq
rt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*
x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6
*x/(sqrt(-c^2*x^2 + 1) + 1)) + 8/3*b*c^7*d*x^5*e^2/((c^16*x^11/(sqrt(-c^2*x
^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2
+ 1) + 1)^5) + 8*b*c^6*d*x^4*arcsin(c*x)*e^2/((c^16*x^11/(sqrt(-c^2*x^2 +
1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt
(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
+ 1)^4) + 6*a*c^6*d^2*x^2*e/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^
14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
+ 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) +
1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 16/15*
b*c^7*x^7*e^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(
sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(s
qrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 32/5*b*c^6*x^6*arcsin
(c*x)*e^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x
^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 8*a*c^6*d*x^4*e^2/((c^16*
x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 3*b*c^5*d^2*x*e/((c^16*x^11/(sqrt(-c^2*x^2
+ 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-

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c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)) + 32/5*a*c^6*x^6*e^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*
c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^
7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 10/3
*b*c^5*d*x^3*e^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt
(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^
5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x
/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) + 16/15*b*c^5*x^5*e^
3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1)
+ 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2
 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) + 2/3*b*c^3*d*x*e^2/((c^16*x^11/(sq
rt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*
x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5
*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt
(-c^2*x^2 + 1) + 1)) + 8/15*b*c^3*x^3*e^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) +
 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2
 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^3) + 8/75*b*c*x*e^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/
(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^
10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1))
```

3.621 $\int \frac{(d+ex^2)^3(a+b\sin^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=262

$$-\frac{3}{2}ibd^2e\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+3d^2e\log(x)\left(a+b\sin^{-1}(cx)\right)-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x$$

```
[Out] -(b*c*d^3*Sqrt[1 - c^2*x^2])/(2*x) + (3*b*e^2*(8*c^2*d + e)*x*Sqrt[1 - c^2*
x^2])/(32*c^3) + (b*e^3*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (3*b*e^2*(8*c^2*d +
 e)*ArcSin[c*x])/(32*c^4) - ((3*I)/2)*b*d^2*e*ArcSin[c*x]^2 - (d^3*(a + b*A
rcSin[c*x]))/(2*x^2) + (3*d*e^2*x^2*(a + b*ArcSin[c*x]))/2 + (e^3*x^4*(a +
b*ArcSin[c*x]))/4 + 3*b*d^2*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
3*b*d^2*e*ArcSin[c*x]*Log[x] + 3*d^2*e*(a + b*ArcSin[c*x])*Log[x] - ((3*I)/
2)*b*d^2*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rubi [A] time = 0.779231, antiderivative size = 262, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 16, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.762, Rules used = {266, 43, 4731, 12, 6742, 1807, 1584, 459, 321, 216, 2326, 4625, 3717, 2190, 2279, 2391}

$$-\frac{3}{2}ibd^2e\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)+3d^2e\log(x)\left(a+b\sin^{-1}(cx)\right)-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```


```
[Out] -(b*c*d^3*Sqrt[1 - c^2*x^2])/(2*x) + (3*b*e^2*(8*c^2*d + e)*x*Sqrt[1 - c^2*
x^2])/(32*c^3) + (b*e^3*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (3*b*e^2*(8*c^2*d +
 e)*ArcSin[c*x])/(32*c^4) - ((3*I)/2)*b*d^2*e*ArcSin[c*x]^2 - (d^3*(a + b*A
rcSin[c*x]))/(2*x^2) + (3*d*e^2*x^2*(a + b*ArcSin[c*x]))/2 + (e^3*x^4*(a +
b*ArcSin[c*x]))/4 + 3*b*d^2*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
3*b*d^2*e*ArcSin[c*x]*Log[x] + 3*d^2*e*(a + b*ArcSin[c*x])*Log[x] - ((3*I)/
2)*b*d^2*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 1807

```
Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{
Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, S
imp[(R*(c*x)^(m + 1)*(a + b*x^2)^(p + 1))/(a*c*(m + 1)), x] + Dist[1/(a*c*(
m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m
 + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ
[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])
```

Rule 1584

```
Int[(u_.)*(x_)^(m_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol]
 :> Int[u*x^(m + n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, m, p, q}, x]
&& IntegerQ[n] && PosQ[q - p]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{x^3}\,dx = -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx)\right)+3d^2e\,(a$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx)\right)+3d^2e\,(a$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx)\right)+3d^2e\,(a$$

$$= -\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx)\right)+3d^2e\,(a$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\sin\right.$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\sin\right.$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}-\frac{3}{2}ibd^2e\sin^{-1}(cx)^2-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{3be^2\left(8c^2d+e\right)x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}-\frac{3}{2}ibd^2e\sin^{-1}(cx)$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{3be^2\left(8c^2d+e\right)x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}-\frac{3be^2\left(8c^2d+e\right)s}{32c^4}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{3be^2\left(8c^2d+e\right)x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}-\frac{3be^2\left(8c^2d+e\right)s}{32c^4}$$

Mathematica [A] time = 0.414839, size = 220, normalized size = 0.84

$$\frac{1}{32}\left(96bd^2e\left(\sin^{-1}(cx)\log\left(1-e^{2i\sin^{-1}(cx)}\right)-\frac{1}{2}i\left(\sin^{-1}(cx)^2+\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right)\right)+96ad^2e\log(x)-\frac{16ad^3}{x^2}+48ad\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] ((-16*a*d^3)/x^2 + 48*a*d*e^2*x^2 + 8*a*e^3*x^4 - (16*b*d^3*(c*x*Sqrt[1 - c
^2*x^2] + ArcSin[c*x]))/x^2 + (24*b*d*e^2*(c*x*Sqrt[1 - c^2*x^2] + (-1 + 2*
c^2*x^2)*ArcSin[c*x]))/c^2 + (b*e^3*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2)
+ (-3 + 8*c^4*x^4)*ArcSin[c*x]))/c^4 + 96*a*d^2*e*Log[x] + 96*b*d^2*e*(ArcS
in[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*(ArcSin[c*x]^2 + PolyLog[2,
E^((2*I)*ArcSin[c*x])])))/32
```

Maple [A] time = 0.599, size = 345, normalized size = 1.3

$$\frac{ae^3x^4}{4}+\frac{3\,ax^2de^2}{2}-\frac{d^3a}{2\,x^2}+3\,ad^2e\ln(cx)-3\,ibd^2e\mathrm{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)-3\,ibd^2e\mathrm{polylog}\left(2,icx+\sqrt{-c^2x^2+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x)
```

```
[Out] 1/4*a*e^3*x^4+3/2*a*x^2*d*e^2-1/2*d^3*a/x^2+3*a*d^2*e*ln(c*x)-3*I*b*d^2*e*p
olylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*b*d^2*e*polylog(2,I*c*x+(-c^2*x^2+1
)^(1/2))-1/2*b*c*d^3*(-c^2*x^2+1)^(1/2)/x+1/16*b*e^3*x^3*(-c^2*x^2+1)^(1/2)
/c+3/32/c^3*b*(-c^2*x^2+1)^(1/2)*x*e^3-3/4/c^2*b*arcsin(c*x)*d*e^2+3/2*b*ar
csin(c*x)*x^2*d*e^2+3*b*d^2*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3*
b*d^2*e*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*d^3*b*arcsin(c*x)/x^
2+1/4*b*arcsin(c*x)*e^3*x^4-3/2*I*b*d^2*e*arcsin(c*x)^2-3/32/c^4*b*arcsin(c
*x)*e^3+3/4/c*b*(-c^2*x^2+1)^(1/2)*x*d*e^2+1/2*I*c^2*d^3*b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}\,ae^3x^4+\frac{3}{2}\,ade^2x^2-\frac{1}{2}\,bd^3\left(\frac{\sqrt{-c^2x^2+1}c}{x}+\frac{\arcsin(cx)}{x^2}\right)+3\,ad^2e\log(x)-\frac{ad^3}{2\,x^2}+\int\frac{\left(be^3x^4+3\,bde^2x^2+3\,bd^2e\right)\mathrm{arct}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*e^3*x^4 + 3/2*a*d*e^2*x^2 - 1/2*b*d^3*(sqrt(-c^2*x^2 + 1)*c/x + arcsi
n(c*x)/x^2) + 3*a*d^2*e*log(x) - 1/2*a*d^3/x^2 + integrate((b*e^3*x^4 + 3*b
*d*e^2*x^2 + 3*b*d^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{ae^3x^6+3\,ade^2x^4+3\,ad^2ex^2+ad^3+\left(be^3x^6+3\,bde^2x^4+3\,bd^2ex^2+bd^3\right)\arcsin(cx)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\,\mathrm{asin}\,(cx))\left(d + ex^2\right)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**3/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2 + d\right)^3 (b \arcsin{(cx)} + a)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)/x^3, x)
```

3.622 $\int \frac{(d+ex^2)^3(a+b\sin^{-1}(cx))}{x^4}\,dx$

Optimal. Leaf size=186

$$-\frac{3d^2e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+3de^2x\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}bcd^2\left(c^2d+18e\right.$$

```
[Out] (b*e^2*(9*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*c*d^3*Sqrt[1 - c^2*x^2
])/(6*x^2) - (b*e^3*(1 - c^2*x^2)^(3/2))/(9*c^3) - (d^3*(a + b*ArcSin[c*x])
)/(3*x^3) - (3*d^2*e*(a + b*ArcSin[c*x]))/x + 3*d*e^2*x*(a + b*ArcSin[c*x])
 + (e^3*x^3*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(c^2*d + 18*e)*ArcTanh[Sqrt[1
 - c^2*x^2]])/6
```

Rubi [A] time = 0.315391, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {270, 4731, 12, 1799, 1621, 897, 1153, 208}

$$-\frac{3d^2e\left(a+b\sin^{-1}(cx)\right)}{x}-\frac{d^3\left(a+b\sin^{-1}(cx)\right)}{3x^3}+3de^2x\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}e^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}bcd^2\left(c^2d+18e\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*e^2*(9*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*c*d^3*Sqrt[1 - c^2*x^2
])/(6*x^2) - (b*e^3*(1 - c^2*x^2)^(3/2))/(9*c^3) - (d^3*(a + b*ArcSin[c*x])
)/(3*x^3) - (3*d^2*e*(a + b*ArcSin[c*x]))/x + 3*d*e^2*x*(a + b*ArcSin[c*x])
 + (e^3*x^3*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(c^2*d + 18*e)*ArcTanh[Sqrt[1
 - c^2*x^2]])/6
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1621

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :
> With[{Qx = PolynomialQuotient[Px, a + b*x, x], R = PolynomialRemainder[Px
, a + b*x, x]}, Simp[(R*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((m + 1)*(b*c
- a*d)), x] + Dist[1/((m + 1)*(b*c - a*d)), Int[(a + b*x)^(m + 1)*(c + d*x)
^n*ExpandToSum[(m + 1)*(b*c - a*d)*Qx - d*R*(m + n + 2), x], x], x]] /; Fre
eQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[m, -1] && GtQ[Expon[Px, x],
2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\sin^{-1}(cx))}{x^4} dx = -\frac{d^3 (a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e (a+b\sin^{-1}(cx))}{x} + 3de^2x (a+b\sin^{-1}(cx)) + \frac{1}{3}e^3x^3$$

$$= -\frac{d^3 (a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e (a+b\sin^{-1}(cx))}{x} + 3de^2x (a+b\sin^{-1}(cx)) + \frac{1}{3}e^3x^3$$

$$= -\frac{d^3 (a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e (a+b\sin^{-1}(cx))}{x} + 3de^2x (a+b\sin^{-1}(cx)) + \frac{1}{3}e^3x^3$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3 (a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e (a+b\sin^{-1}(cx))}{x} + 3de^2x (a+b\,\mathrm{si}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3 (a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e (a+b\sin^{-1}(cx))}{x} + 3de^2x (a+b\,\mathrm{si}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3 (a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e (a+b\sin^{-1}(cx))}{x} + 3de^2x (a+b\,\mathrm{si}$$

$$= \frac{be^2 (9c^2d+e) \sqrt{1-c^2x^2}}{3c^3} - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{be^3 (1-c^2x^2)^{3/2}}{9c^3} - \frac{d^3 (a+b\sin^{-1}(c}{3x^3}$$

$$= \frac{be^2 (9c^2d+e) \sqrt{1-c^2x^2}}{3c^3} - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{be^3 (1-c^2x^2)^{3/2}}{9c^3} - \frac{d^3 (a+b\sin^{-1}(c}{3x^3}$$

Mathematica [A] time = 0.251719, size = 194, normalized size = 1.04

$$\frac{1}{6}\left(-\frac{18ad^2e}{x} - \frac{2ad^3}{x^3} + 18ade^2x + 2ae^3x^3 + \frac{b\sqrt{1-c^2x^2} (-3c^4d^3 + 2c^2e^2x^2 (27d+ex^2) + 4e^3x^2)}{3c^3x^2} - bcd^2 (c^2d+18e) \log\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^3)/x^3 - (18*a*d^2*e)/x + 18*a*d*e^2*x + 2*a*e^3*x^3 + (b*Sqrt[1 -
 c^2*x^2]*(-3*c^4*d^3 + 4*e^3*x^2 + 2*c^2*e^2*x^2*(27*d + e*x^2)))/(3*c^3*x
^2) + (2*b*(-d^3 - 9*d^2*e*x^2 + 9*d*e^2*x^4 + e^3*x^6)*ArcSin[c*x])/x^3 +
b*c*d^2*(c^2*d + 18*e)*Log[x] - b*c*d^2*(c^2*d + 18*e)*Log[1 + Sqrt[1 - c^2
*x^2]])/6
```

Maple [A] time = 0.01, size = 249, normalized size = 1.3

$$c^3\left(\frac{a}{c^6}\left(\frac{e^3c^3x^3}{3} + 3c^3xde^2 - 3\frac{c^3d^2e}{x} - \frac{c^3d^3}{3x^3}\right) + \frac{b}{c^6}\left(\frac{\arcsin(cx)e^3c^3x^3}{3} + 3\arcsin(cx)c^3xde^2 - 3\frac{\arcsin(cx)c^3d^2e}{x} - \frac{\mathrm{a}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x)
```

```
[Out] c^3*(a/c^6*(1/3*e^3*c^3*x^3+3*c^3*x*d*e^2-3*c^3*d^2*e/x-1/3*d^3*c^3/x^3)+b/
c^6*(1/3*arcsin(c*x)*e^3*c^3*x^3+3*arcsin(c*x)*c^3*x*d*e^2-3*arcsin(c*x)*c^
```

```
3*d^2*e/x-1/3*arcsin(c*x)*d^3*c^3/x^3-1/3*e^3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1
/2)-2/3*(-c^2*x^2+1)^(1/2))+3*c^2*d*e^2*(-c^2*x^2+1)^(1/2)-3*c^4*d^2*e*arct
anh(1/(-c^2*x^2+1)^(1/2))+1/3*d^3*c^6*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*
arctanh(1/(-c^2*x^2+1)^(1/2)))))
```

Maxima [A] time = 1.47079, size = 312, normalized size = 1.68

$$\frac{1}{3}ae^3x^3 - \frac{1}{6}\left(\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\sqrt{-c^2x^2+1}}{x^2}\right)c + \frac{2\arcsin(cx)}{x^3}\right)bd^3 - 3\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin}{x}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/3*a*e^3*x^3 - 1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqr
t(-c^2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^3 - 3*(c*log(2*sqrt(-c^2*x^
2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d^2*e + 1/9*(3*x^3*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^3 + 3*a*d
*e^2*x + 3*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*e^2/c - 3*a*d^2*e/x -
 1/3*a*d^3/x^3
```

Fricas [A] time = 4.12765, size = 541, normalized size = 2.91

$$\frac{12\,ac^3e^3x^6 + 108\,ac^3de^2x^4 - 108\,ac^3d^2ex^2 - 12\,ac^3d^3 - 3\left(bc^6d^3 + 18\,bc^4d^2e\right)x^3\log\left(\sqrt{-c^2x^2+1}+1\right) + 3\left(bc^6d^3 + 18\,bc^4d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/36*(12*a*c^3*e^3*x^6 + 108*a*c^3*d*e^2*x^4 - 108*a*c^3*d^2*e*x^2 - 12*a*c
^3*d^3 - 3*(b*c^6*d^3 + 18*b*c^4*d^2*e)*x^3*log(sqrt(-c^2*x^2 + 1) + 1) + 3
*(b*c^6*d^3 + 18*b*c^4*d^2*e)*x^3*log(sqrt(-c^2*x^2 + 1) - 1) + 12*(b*c^3*e
^3*x^6 + 9*b*c^3*d*e^2*x^4 - 9*b*c^3*d^2*e*x^2 - b*c^3*d^3)*arcsin(c*x) + 2
*(2*b*c^2*e^3*x^5 - 3*b*c^4*d^3*x + 2*(27*b*c^2*d*e^2 + 2*b*e^3)*x^3)*sqrt(
-c^2*x^2 + 1))/(c^3*x^3)
```

Sympy [A] time = 10.3274, size = 311, normalized size = 1.67

$$-\frac{ad^3}{3x^3} - \frac{3ad^2e}{x} + 3ade^2x + \frac{ae^3x^3}{3} + \frac{bcd^3\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} - \frac{c\sqrt{-1+\frac{1}{c^2x^2}}}{2x} & \text{for } \frac{1}{|c^2x^2|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic}{2x\sqrt{1-\frac{1}{c^2x^2}}} + \frac{i}{2cx^3\sqrt{1-\frac{1}{c^2x^2}}} & \text{otherwise} \end{cases}\right)}{3} + 3bcd^2e\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) \\ i\operatorname{asin}\left(\frac{1}{cx}\right) \end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) - 3*a*d**2*e/x + 3*a*d*e**2*x + a*e**3*x**3/3 + b*c*d**3*P
iecewise((-c**2*acosh(1/(c*x))/2 - c*sqrt(-1 + 1/(c**2*x**2))/(2*x), 1/Abs(
c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c/(2*x*sqrt(1 - 1/(c**2*x**2))
) + I/(2*c*x**3*sqrt(1 - 1/(c**2*x**2))), True))/3 + 3*b*c*d**2*e*Piecewise
((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*e*
*3*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/
(3*c**4), Ne(c, 0)), (x**4/4, True))/3 - b*d**3*asin(c*x)/(3*x**3) - 3*b*d*
*2*e*asin(c*x)/x + 3*b*d*e**2*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(
-c**2*x**2 + 1)/c, True)) + b*e**3*x**3*asin(c*x)/3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

3.623 $\int (d + ex^2)^4 (a + b\sin^{-1}(cx)) \, dx$

Optimal. Leaf size=317

$$\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{7}de^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^4x^9\left(a+b\mathrm{si}\right.$$

```
[Out] (b*(315*c^8*d^4 + 420*c^6*d^3*e + 378*c^4*d^2*e^2 + 180*c^2*d*e^3 + 35*e^4)
*Sqrt[1 - c^2*x^2])/(315*c^9) - (4*b*e*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c
^2*d*e^2 + 35*e^3)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (2*b*e^2*(63*c^4*d^2 +
90*c^2*d*e + 35*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (4*b*e^3*(9*c^2*d + 7
*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^4*(1 - c^2*x^2)^(9/2))/(81*c^9) +
 d^4*x*(a + b*ArcSin[c*x]) + (4*d^3*e*x^3*(a + b*ArcSin[c*x]))/3 + (6*d^2*e
^2*x^5*(a + b*ArcSin[c*x]))/5 + (4*d*e^3*x^7*(a + b*ArcSin[c*x]))/7 + (e^4*
x^9*(a + b*ArcSin[c*x]))/9
```

Rubi [A] time = 0.340063, antiderivative size = 317, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {194, 4665, 12, 1799, 1850}

$$\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{7}de^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^4x^9\left(a+b\mathrm{si}\right.$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^4*(a + b*ArcSin[c*x]),x]
```


```
[Out] (b*(315*c^8*d^4 + 420*c^6*d^3*e + 378*c^4*d^2*e^2 + 180*c^2*d*e^3 + 35*e^4)
*Sqrt[1 - c^2*x^2])/(315*c^9) - (4*b*e*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c
^2*d*e^2 + 35*e^3)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (2*b*e^2*(63*c^4*d^2 +
90*c^2*d*e + 35*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (4*b*e^3*(9*c^2*d + 7
*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^4*(1 - c^2*x^2)^(9/2))/(81*c^9) +
 d^4*x*(a + b*ArcSin[c*x]) + (4*d^3*e*x^3*(a + b*ArcSin[c*x]))/3 + (6*d^2*e
^2*x^5*(a + b*ArcSin[c*x]))/5 + (4*d*e^3*x^7*(a + b*ArcSin[c*x]))/7 + (e^4*
x^9*(a + b*ArcSin[c*x]))/9
```


Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4665

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1850

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rubi steps

$$\int \left(d+ex^2\right)^4 \left(a+b\sin^{-1}(cx)\right) dx = d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{4}{7}$$

$$= d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{4}{7}$$

$$= d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{4}{7}$$

$$= d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{4}{7}$$

$$= \frac{b\left(315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4\right)\sqrt{1-c^2x^2}}{315c^9}-\frac{4be\left(105c^6d^3\right.}{}$$

Mathematica [A] time = 0.306752, size = 260, normalized size = 0.82

$$\frac{315ax\left(378d^2e^2x^4+420d^3ex^2+315d^4+180de^3x^6+35e^4x^8\right)+\frac{b\sqrt{1-c^2x^2}\left(c^8\left(23814d^2e^2x^4+44100d^3ex^2+99225d^4+8100de^3x^6+1225e^4x\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^4*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x*(315*d^4 + 420*d^3*e*x^2 + 378*d^2*e^2*x^4 + 180*d*e^3*x^6 + 35*e^
4*x^8) + (b*Sqrt[1 - c^2*x^2]*(4480*e^4 + 320*c^2*e^3*(81*d + 7*e*x^2) + 48
*c^4*e^2*(1323*d^2 + 270*d*e*x^2 + 35*e^2*x^4) + 8*c^6*e*(11025*d^3 + 3969*
d^2*e*x^2 + 1215*d*e^2*x^4 + 175*e^3*x^6) + c^8*(99225*d^4 + 44100*d^3*e*x^
2 + 23814*d^2*e^2*x^4 + 8100*d*e^3*x^6 + 1225*e^4*x^8)))/c^9 + 315*b*x*(315
*d^4 + 420*d^3*e*x^2 + 378*d^2*e^2*x^4 + 180*d*e^3*x^6 + 35*e^4*x^8)*ArcSin
[c*x])/99225
```

Maple [A] time = 0.004, size = 465, normalized size = 1.5

$$\frac{1}{c}\left(\frac{a}{c^8}\left(\frac{e^4c^9x^9}{9}+\frac{4\,c^9de^3x^7}{7}+\frac{6\,c^9d^2e^2x^5}{5}+\frac{4\,c^9d^3ex^3}{3}+c^9d^4x\right)+\frac{b}{c^8}\left(\frac{\arcsin(cx)\,e^4c^9x^9}{9}+\frac{4\,\arcsin(cx)\,c^9de^3x^7}{7}+\frac{6\,\mathrm{a}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^4*(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(a/c^8*(1/9*e^4*c^9*x^9+4/7*c^9*d*e^3*x^7+6/5*c^9*d^2*e^2*x^5+4/3*c^9*d
^3*e*x^3+c^9*d^4*x)+b/c^8*(1/9*arcsin(c*x)*e^4*c^9*x^9+4/7*arcsin(c*x)*c^9*
```

```
d*e^3*x^7+6/5*arcsin(c*x)*c^9*d^2*e^2*x^5+4/3*arcsin(c*x)*c^9*d^3*e*x^3+arc
sin(c*x)*c^9*d^4*x-1/9*e^4*(-1/9*c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-
c^2*x^2+1)^(1/2)-16/105*c^4*x^4*(-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2
+1)^(1/2)-128/315*(-c^2*x^2+1)^(1/2))-4/7*c^2*d*e^3*(-1/7*c^6*x^6*(-c^2*x^2
+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-1
6/35*(-c^2*x^2+1)^(1/2))-6/5*c^4*d^2*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4
/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-4/3*c^6*d^3*e*(-1/3
*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+c^8*d^4*(-c^2*x^2+1)^(1
/2)))
```

Maxima [A] time = 1.49512, size = 572, normalized size = 1.8

$$\frac{1}{9}ae^4x^9 + \frac{4}{7}ade^3x^7 + \frac{6}{5}ad^2e^2x^5 + \frac{4}{3}ad^3ex^3 + \frac{4}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3e + \frac{2}{25}\left(15x^5 \text{a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*e^4*x^9 + 4/7*a*d*e^3*x^7 + 6/5*a*d^2*e^2*x^5 + 4/3*a*d^3*e*x^3 + 4/9
*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/
c^4))*b*d^3*e + 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 +
4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^2*e^2 + 4/2
45*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 +
1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b
*d*e^3 + 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*
sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x
^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*e^4 + a*d^4*x + (c*x*ar
csin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^4/c
```

Fricas [A] time = 2.48234, size = 782, normalized size = 2.47

$$\frac{11025\,ac^9e^4x^9 + 56700\,ac^9de^3x^7 + 119070\,ac^9d^2e^2x^5 + 132300\,ac^9d^3ex^3 + 99225\,ac^9d^4x + 315\left(35\,bc^9e^4x^9 + 180\,bc^9de^3x^7\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*e^4*x^9 + 56700*a*c^9*d*e^3*x^7 + 119070*a*c^9*d^2*e^2
*x^5 + 132300*a*c^9*d^3*e*x^3 + 99225*a*c^9*d^4*x + 315*(35*b*c^9*e^4*x^9 +
 180*b*c^9*d*e^3*x^7 + 378*b*c^9*d^2*e^2*x^5 + 420*b*c^9*d^3*e*x^3 + 315*b*
c^9*d^4*x)*arcsin(c*x) + (1225*b*c^8*e^4*x^8 + 99225*b*c^8*d^4 + 88200*b*c^
6*d^3*e + 63504*b*c^4*d^2*e^2 + 25920*b*c^2*d*e^3 + 100*(81*b*c^8*d*e^3 + 1
4*b*c^6*e^4)*x^6 + 4480*b*e^4 + 6*(3969*b*c^8*d^2*e^2 + 1620*b*c^6*d*e^3 +
280*b*c^4*e^4)*x^4 + 4*(11025*b*c^8*d^3*e + 7938*b*c^6*d^2*e^2 + 3240*b*c^4
*d*e^3 + 560*b*c^2*e^4)*x^2)*sqrt(-c^2*x^2 + 1))/c^9
```

Sympy [A] time = 25.2348, size = 593, normalized size = 1.87

$$\begin{cases} ad^4x + \frac{4ad^3ex^3}{3} + \frac{6ad^2e^2x^5}{5} + \frac{4ade^3x^7}{7} + \frac{ae^4x^9}{9} + bd^4x\operatorname{asin}(cx) + \frac{4bd^3ex^3\operatorname{asin}(cx)}{3} + \frac{6bd^2e^2x^5\operatorname{asin}(cx)}{5} + \frac{4bde^3x^7\operatorname{asin}(cx)}{7} + \frac{be^4x^9\operatorname{asin}(c}{9} \\ a\left(d^4x + \frac{4d^3ex^3}{3} + \frac{6d^2e^2x^5}{5} + \frac{4de^3x^7}{7} + \frac{e^4x^9}{9}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**4*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**4*x + 4*a*d**3*e*x**3/3 + 6*a*d**2*e**2*x**5/5 + 4*a*d*e**3
*x**7/7 + a*e**4*x**9/9 + b*d**4*x*asin(c*x) + 4*b*d**3*e*x**3*asin(c*x)/3
+ 6*b*d**2*e**2*x**5*asin(c*x)/5 + 4*b*d*e**3*x**7*asin(c*x)/7 + b*e**4*x**
9*asin(c*x)/9 + b*d**4*sqrt(-c**2*x**2 + 1)/c + 4*b*d**3*e*x**2*sqrt(-c**2*
x**2 + 1)/(9*c) + 6*b*d**2*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 4*b*d*e*
*3*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b*e**4*x**8*sqrt(-c**2*x**2 + 1)/(81*
c) + 8*b*d**3*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + 8*b*d**2*e**2*x**2*sqrt(-c*
*2*x**2 + 1)/(25*c**3) + 24*b*d*e**3*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) +
 8*b*e**4*x**6*sqrt(-c**2*x**2 + 1)/(567*c**3) + 16*b*d**2*e**2*sqrt(-c**2*
x**2 + 1)/(25*c**5) + 32*b*d*e**3*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16
*b*e**4*x**4*sqrt(-c**2*x**2 + 1)/(945*c**5) + 64*b*d*e**3*sqrt(-c**2*x**2
+ 1)/(245*c**7) + 64*b*e**4*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e
**4*sqrt(-c**2*x**2 + 1)/(2835*c**9), Ne(c, 0)), (a*(d**4*x + 4*d**3*e*x**3
/3 + 6*d**2*e**2*x**5/5 + 4*d*e**3*x**7/7 + e**4*x**9/9), True))
```

Giac [B] time = 1.39186, size = 1004, normalized size = 3.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*x^9*e^4 + 4/7*a*d*x^7*e^3 + 6/5*a*d^2*x^5*e^2 + 4/3*a*d^3*x^3*e + b*d
^4*x*arcsin(c*x) + a*d^4*x + 4/3*(c^2*x^2 - 1)*b*d^3*x*arcsin(c*x)*e/c^2 +
4/3*b*d^3*x*arcsin(c*x)*e/c^2 + sqrt(-c^2*x^2 + 1)*b*d^4/c + 6/5*(c^2*x^2 -
 1)^2*b*d^2*x*arcsin(c*x)*e^2/c^4 - 4/9*(-c^2*x^2 + 1)^(3/2)*b*d^3*e/c^3 +
12/5*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)*e^2/c^4 + 4/3*sqrt(-c^2*x^2 + 1)*b*d
^3*e/c^3 + 4/7*(c^2*x^2 - 1)^3*b*d*x*arcsin(c*x)*e^3/c^6 + 6/5*b*d^2*x*arcs
in(c*x)*e^2/c^4 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2*e^2/c^5 + 1
2/7*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)*e^3/c^6 - 4/5*(-c^2*x^2 + 1)^(3/2)*b*
d^2*e^2/c^5 + 1/9*(c^2*x^2 - 1)^4*b*x*arcsin(c*x)*e^4/c^8 + 12/7*(c^2*x^2 -
 1)*b*d*x*arcsin(c*x)*e^3/c^6 + 4/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d
*e^3/c^7 + 6/5*sqrt(-c^2*x^2 + 1)*b*d^2*e^2/c^5 + 4/9*(c^2*x^2 - 1)^3*b*x*a
rcsin(c*x)*e^4/c^8 + 4/7*b*d*x*arcsin(c*x)*e^3/c^6 + 12/35*(c^2*x^2 - 1)^2*
sqrt(-c^2*x^2 + 1)*b*d*e^3/c^7 + 2/3*(c^2*x^2 - 1)^2*b*x*arcsin(c*x)*e^4/c^
8 + 1/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^4/c^9 - 4/7*(-c^2*x^2 + 1)^
(3/2)*b*d*e^3/c^7 + 4/9*(c^2*x^2 - 1)*b*x*arcsin(c*x)*e^4/c^8 + 4/63*(c^2*x
^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^4/c^9 + 4/7*sqrt(-c^2*x^2 + 1)*b*d*e^3/c^7
 + 1/9*b*x*arcsin(c*x)*e^4/c^8 + 2/15*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*
e^4/c^9 - 4/27*(-c^2*x^2 + 1)^(3/2)*b*e^4/c^9 + 1/9*sqrt(-c^2*x^2 + 1)*b*e^
4/c^9
```

3.624 $\int \frac{x^4(a+b\sin^{-1}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=653

$$\frac{ib(-d)^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}-\frac{ib(-d)^{3/2}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}+\frac{ib(-d)^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}-$$

```
[Out] -((a*d*x)/e^2) - (b*d*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*Sqrt[1 - c^2*x^2])/(3
*c^3*e) - (b*(1 - c^2*x^2)^(3/2))/(9*c^3*e) - (b*d*x*ArcSin[c*x])/e^2 + (x^
3*(a + b*ArcSin[c*x]))/(3*e) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 - (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) - ((
-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log
[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5
/2)) - ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/
(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((I/2)*b*(-d)^(3/2)*PolyLo
g[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^(5
/2) - ((I/2)*b*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[
-d] - Sqrt[c^2*d + e])])/e^(5/2) + ((I/2)*b*(-d)^(3/2)*PolyLog[2, -((Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2) - ((I/2)*b
*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2
*d + e])])/e^(5/2)
```

Rubi [A] time = 1.05255, antiderivative size = 653, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4733, 4619, 261, 4627, 266, 43, 4667, 4741, 4521, 2190, 2279, 2391}

$$\frac{ib(-d)^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}-\frac{ib(-d)^{3/2}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}+\frac{ib(-d)^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```


```
[Out] -((a*d*x)/e^2) - (b*d*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*Sqrt[1 - c^2*x^2])/(3
*c^3*e) - (b*(1 - c^2*x^2)^(3/2))/(9*c^3*e) - (b*d*x*ArcSin[c*x])/e^2 + (x^
3*(a + b*ArcSin[c*x]))/(3*e) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 - (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) - ((
-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log
[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5
/2)) - ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/
(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((I/2)*b*(-d)^(3/2)*PolyLo
g[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^(5
/2) - ((I/2)*b*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[
-d] - Sqrt[c^2*d + e])])/e^(5/2) + ((I/2)*b*(-d)^(3/2)*PolyLog[2, -((Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2) - ((I/2)*b
*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2
*d + e])])/e^(5/2)
```


Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
```

```
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx = \int\left(-\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^2}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{e}+\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$= -\frac{d\int\left(a+b\sin^{-1}(cx)\right)dx}{e^2}+\frac{d^2\int\frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{e^2}+\frac{\int x^2\left(a+b\sin^{-1}(cx)\right)dx}{e}$$

$$= -\frac{adx}{e^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3e}-\frac{(bd)\int\sin^{-1}(cx)\,dx}{e^2}+\frac{d^2\int\left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx\right.}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right.}{e^2}$$

$$= -\frac{adx}{e^2}-\frac{bdx\sin^{-1}(cx)}{e^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3e}-\frac{(-d)^{3/2}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e^2}-\frac{(-d)^{3/2}\int\frac{a+b\sin^{-1}(}{\sqrt{-d}+\sqrt{e}}}{2e^2}$$

$$= -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}-\frac{bdx\sin^{-1}(cx)}{e^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3e}-\frac{(-d)^{3/2}\,\mathrm{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(}\right.}{2e^2}$$

$$= -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}-\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^3e}-\frac{bdx\sin^{-1}(cx)}{e^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3e}$$

$$= -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}-\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^3e}-\frac{bdx\sin^{-1}(cx)}{e^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3e}$$

$$= -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}-\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^3e}-\frac{bdx\sin^{-1}(cx)}{e^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3e}$$

$$= -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}-\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^3e}-\frac{bdx\sin^{-1}(cx)}{e^2}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{3e}$$

Mathematica [A] time = 0.929567, size = 515, normalized size = 0.79

$$b\left(d^{3/2}\left(-2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)-2\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)-\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\right.\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] -((a*d*x)/e^2) + (a*x^3)/(3*e) + (a*d^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/e^
(5/2) + (b*((-4*d*Sqrt[e]*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]))/c + (4*e^(
3/2)*(Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + 3*c^3*x^3*ArcSin[c*x]))/(9*c^3) + d
^(3/2)*(-(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*
x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(
c*Sqrt[d] + Sqrt[c^2*d + e])]))) - 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))
/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] - 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*
x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) + d^(3/2)*(ArcSin[c*x]*(ArcSin[c*x] +
 (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e]
)] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) +
 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] +
2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/
(4*e^(5/2))
```

Maple [C] time = 1.555, size = 363, normalized size = 0.6

$$\frac{ax^3}{3e} - \frac{adx}{e^2} + \frac{ad^2}{e^2}\arctan\left(ex\frac{1}{\sqrt{de}}\right)\frac{1}{\sqrt{de}} + \frac{2b}{9c^3e}\sqrt{-c^2x^2+1} + \frac{cbd^2}{2e^2}\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{1}{\_R1\left(\_R1^2e-2c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

```
[Out] 1/3*a/e*x^3-a*d*x/e^2+a*d^2/e^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+2/9*b*(
-c^2*x^2+1)^(1/2)/c^3/e+1/2*c*b*d^2/e^2*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*ar
csin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2
+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*c*b*d^2/e^2*
sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2)
)/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2
*d-2*e)*_Z^2+e))+1/9/c*b/e*(-c^2*x^2+1)^(1/2)*x^2+1/3*b*arcsin(c*x)/e*x^3-b
*d*x*arcsin(c*x)/e^2-b*d*(-c^2*x^2+1)^(1/2)/c/e^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^4\arcsin(cx) + ax^4}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4 (a + b \operatorname{asin}(cx))}{d + ex^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.625 $\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx$

Optimal. Leaf size=559

$$\frac{ibd\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{ibd\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{ibd\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+ibd\,\text{PolyLog}\Big($$

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(4*c*e) - (b*ArcSin[c*x])/(4*c^2*e) + (x^2*(a + b*A
rcSin[c*x]))/(2*e) + ((I/2)*d*(a + b*ArcSin[c*x])^2)/(b*e^2) - (d*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1
- (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) -
(d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] +
Sqrt[c^2*d + e])])/(2*e^2) + ((I/2)*b*d*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^2 + ((I/2)*b*d*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))]
)/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/e^2
```

Rubi [A] time = 0.910711, antiderivative size = 559, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4733, 4627, 321, 216, 4741, 4521, 2190, 2279, 2391}

$$\frac{ibd\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{ibd\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{ibd\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+ibd\,\text{PolyLog}\Big($$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(4*c*e) - (b*ArcSin[c*x])/(4*c^2*e) + (x^2*(a + b*A
rcSin[c*x]))/(2*e) + ((I/2)*d*(a + b*ArcSin[c*x])^2)/(b*e^2) - (d*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1
- (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) -
(d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] +
Sqrt[c^2*d + e])])/(2*e^2) + ((I/2)*b*d*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^2 + ((I/2)*b*d*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))]
)/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/e^2
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}dx = \int \left(\frac{x\left(a+b\sin^{-1}(cx)\right)}{e}-\frac{dx\left(a+b\sin^{-1}(cx)\right)}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int x\left(a+b\sin^{-1}(cx)\right)dx}{e}-\frac{d\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}dx}{e}$$

$$= \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2e}-\frac{(bc)\int \frac{x^2}{\sqrt{1-c^2x^2}}dx}{2e}-\frac{d\int \left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2e}+\frac{d\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{2e^{3/2}}-\frac{d\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{2e^{3/2}}-\frac{b\int \frac{1}{\sqrt{1-c^2}}}{4ce}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\sin^{-1}(cx)}{4c^2e}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2e}+\frac{d\,\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx,x,\sin^{-1}\right.}{2e^{3/2}}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\sin^{-1}(cx)}{4c^2e}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2e}+\frac{id\left(a+b\sin^{-1}(cx)\right)^2}{2be^2}+\frac{(id)\,\text{Subst}\left(\right.}{}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\sin^{-1}(cx)}{4c^2e}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2e}+\frac{id\left(a+b\sin^{-1}(cx)\right)^2}{2be^2}-\frac{d\left(a+b\sin\right.}{}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\sin^{-1}(cx)}{4c^2e}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2e}+\frac{id\left(a+b\sin^{-1}(cx)\right)^2}{2be^2}-\frac{d\left(a+b\sin\right.}{}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\sin^{-1}(cx)}{4c^2e}+\frac{x^2\left(a+b\sin^{-1}(cx)\right)}{2e}+\frac{id\left(a+b\sin^{-1}(cx)\right)^2}{2be^2}-\frac{d\left(a+b\sin\right.}{}$$

Mathematica [A] time = 0.35845, size = 454, normalized size = 0.81

$$\frac{b\left(ic^2d\left(2\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\text{l}\right.\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (2*a*c^2*e*x^2 - 2*a*c^2*d*Log[d + e*x^2] + b*(e*(c*x*Sqrt[1 - c^2*x^2] + (
-1 + 2*c^2*x^2)*ArcSin[c*x]) + I*c^2*d*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 +
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2
, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog
[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) + I*c^2*
d*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-
(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sq
rt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*S
qrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sq
rt[d] + Sqrt[c^2*d + e])])))/(4*c^2*e^2)
```

Maple [C] time = 0.512, size = 2854, normalized size = 5.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

```
[Out] -1/4*b*arcsin(c*x)/c^2/e+1/2*a/e*x^2+I*c^4*b*d^3*polylog(2,e*(I*c*x+(-c^2*x
^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^4/(c^2*d+e)*(c^2*d*
(c^2*d+e))^(1/2)+3*I*c^2*b*d^2*arcsin(c*x)^2/e^3/(c^2*d+e)*(c^2*d*(c^2*d+e)
)^(1/2)+2*I*c^4*b*d^3*arcsin(c*x)^2/e^4/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+3
/2*I*c^2*b*d^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(
c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+1/4*b*x*(-c^2*x^2
+1)^(1/2)/c/e-1/2*b/e^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2
*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d-2*c^4*b/e^4*d^3/(c^2*d+e)*ln(1-e*(I*c
*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)
*(c^2*d*(c^2*d+e))^(1/2)-3*c^2*b/e^3*d^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+
1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2*d*(c^2*
d+e))^(1/2)-2*c^4*b/e^4*d^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*
(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)-2*c^2*b/e^3*d^2*ln(1-e*(I*c*x+(-c^2
*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+I*c^4*b
*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2
)+e))*d^3/e^4+I*c^2*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(
c^2*d*(c^2*d+e))^(1/2)+e))*d^2/e^3+1/2*b*arcsin(c*x)/e*x^2-1/2*a*d/e^2*ln(c
^2*e*x^2+c^2*d)-3/2*b/e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*
c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2*d*(c^2*d+e))^(1/2)*d+2
*c^6*b/e^4*d^4/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^
2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+4*c^4*b/e^3*d^3/(c^2*d+e)*ln(1-e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+
5/2*c^2*b/e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2
*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^2+2*c^2*b/e^4*d^2*ln(1-e*(I*c*x+(-c^2
*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2*d*
(c^2*d+e))^(1/2)+1/4/c^2*b*(c^2*d*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(c*x)*
ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))-
1/4/c^2*b/e/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d
*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2*d*(c^2*d+e))^(1/2)+I*b*(c^2*d*(c^2*d
+e))^(1/2)/e^2*d/(c^2*d+e)*arcsin(c*x)^2+1/2*b*(c^2*d*(c^2*d+e))^(1/2)/e^2*
d/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2
*d*(c^2*d+e))^(1/2)+e))-4*I*c^4*b*d^3*arcsin(c*x)^2/e^3/(c^2*d+e)-1/8*I/c^2
*b*(c^2*d*(c^2*d+e))^(1/2)/e/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2
))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))-2*I*c^4*b*d^3*polylog(2,e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e
)-5/4*I*c^2*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c
^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)*d^2-5/2*I*c^2*b*d^2*arcsin(c*x)^2/e^2/(c^2
*d+e)-I*c^2*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c
^2*d+e))^(1/2)+e))*d^2/e^4*(c^2*d*(c^2*d+e))^(1/2)-1/4*I*b*(c^2*d*(c^2*d+e)
)^(1/2)/e^2*d/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2
*(c^2*d*(c^2*d+e))^(1/2)+e))+3/4*I*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)*(c^2*d*(c^2*d+e))^(
1/2)*d-2*I*c^6*b*d^4*arcsin(c*x)^2/e^4/(c^2*d+e)-I*c^6*b*d^4*polylog(2,e*(I
*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^4/(c^2*
d+e)-2*I*c^2*b*arcsin(c*x)^2*d^2/e^4*(c^2*d*(c^2*d+e))^(1/2)+1/8*I/c^2*b*po
lylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e
))/e/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+1/2*b/e/(c^2*d+e)*ln(1-e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d+b/e^
3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)
)*arcsin(c*x)*d*(c^2*d*(c^2*d+e))^(1/2)+2*I*c^2*b*arcsin(c*x)^2*d^2/e^3+2*I
*c^4*b*arcsin(c*x)^2*d^3/e^4-1/2*I*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*d/e^3*(c^2*d*(c^2*d+e))^(1/2)-I*b
*arcsin(c*x)^2*d/e^3*(c^2*d*(c^2*d+e))^(1/2)-1/2*I*b*arcsin(c*x)^2/e/(c^2*d
+e)*d-1/4*I*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c
^2*d+e))^(1/2)+e))/e/(c^2*d+e)*d+I*b*d*arcsin(c*x)^2/e^2+1/2*I*b*d/e^2*sum(
```

```
(_R1^2*e-4*c^2*d-2*e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^
2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(
e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/4*I*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2
))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*d/e^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{x^2}{e}-\frac{d\log\left(ex^2+d\right)}{e^2}\right)+b\int\frac{x^3\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(x^2/e - d*log(e*x^2 + d)/e^2) + b*integrate(x^3*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))/(e*x^2 + d), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^3\arcsin\left(cx\right)+ax^3}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^3\left(a+b\operatorname{asin}\left(cx\right)\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)x^3}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d), x)
```

3.626 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx$

Optimal. Leaf size=579

$$\frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}+\frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{-d}}{}$$

```
[Out] (a*x)/e + (b*Sqrt[1 - c^2*x^2])/(c*e) + (b*x*ArcSin[c*x])/e + (Sqrt[-d]*(a
+ b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(3/2)) + (Sqrt[-d
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(3/2)) + ((I
/2)*b*Sqrt[-d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e]))])/e^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(3/2) + ((I/2)*b*Sqrt[-d]*Pol
yLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e
^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e])])/e^(3/2)
```

Rubi [A] time = 0.903657, antiderivative size = 579, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4733, 4619, 261, 4667, 4741, 4521, 2190, 2279, 2391}

$$\frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}+\frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{-d}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```


```
[Out] (a*x)/e + (b*Sqrt[1 - c^2*x^2])/(c*e) + (b*x*ArcSin[c*x])/e + (Sqrt[-d]*(a
+ b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(3/2)) + (Sqrt[-d
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(3/2)) + ((I
/2)*b*Sqrt[-d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e]))])/e^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(3/2) + ((I/2)*b*Sqrt[-d]*Pol
yLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e
^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e])])/e^(3/2)
```


Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{e} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \left(a+b\sin^{-1}(cx)\right)dx}{e} - \frac{d\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}dx}{e}$$

$$= \frac{ax}{e} + \frac{b\int \sin^{-1}(cx)\,dx}{e} - \frac{d\int \left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e}$$

$$= \frac{ax}{e} + \frac{bx\sin^{-1}(cx)}{e} - \frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}}dx}{e} - \frac{\sqrt{-d}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{2e} - \frac{\sqrt{-d}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{2e}$$

$$= \frac{ax}{e} + \frac{b\sqrt{1-c^2x^2}}{ce} + \frac{bx\sin^{-1}(cx)}{e} - \frac{\sqrt{-d}\,\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx, x, \sin^{-1}(cx)\right)}{2e} - \frac{\sqrt{-d}\,\text{Sub}}{}$$

$$= \frac{ax}{e} + \frac{b\sqrt{1-c^2x^2}}{ce} + \frac{bx\sin^{-1}(cx)}{e} - \frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}dx, x, \sin^{-1}(cx)\right)}{2e} - \frac{(i}{}$$

$$= \frac{ax}{e} + \frac{b\sqrt{1-c^2x^2}}{ce} + \frac{bx\sin^{-1}(cx)}{e} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{\sqrt{-d}\left(a+\right.}{}$$

$$= \frac{ax}{e} + \frac{b\sqrt{1-c^2x^2}}{ce} + \frac{bx\sin^{-1}(cx)}{e} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{\sqrt{-d}\left(a+\right.}{}$$

$$= \frac{ax}{e} + \frac{b\sqrt{1-c^2x^2}}{ce} + \frac{bx\sin^{-1}(cx)}{e} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{\sqrt{-d}\left(a+\right.}{}$$

Mathematica [A] time = 0.348801, size = 456, normalized size = 0.79

$$\frac{b\left(c\sqrt{d}\left(2\text{PolyLog}\left(2, \frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right) + 2\text{PolyLog}\left(2, -\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right) + \sin^{-1}(cx)\left(\sin^{-1}(cx) + 2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right) + \log\right.\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (4*a*c*Sqrt[e]*x - 4*a*c*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] + b*(4*Sqrt[e]
*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) + c*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x
] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e]
)] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) +
 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])]
 + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])
)]) - c*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(4*c*e^(3/2))
```

Maple [C] time = 0.344, size = 285, normalized size = 0.5

$$\frac{ax}{e} - \frac{ad}{e}\arctan\left(ex\frac{1}{\sqrt{de}}\right)\frac{1}{\sqrt{de}} + \frac{b}{ce}\sqrt{-c^2x^2+1} + \frac{bx\arcsin(cx)}{e} - \frac{cbd}{2e}\sum_{\_R1=\text{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{1}{\_R1\left(\_R1^2e-2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

```
[Out] a*x/e-a*d/e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+b*(-c^2*x^2+1)^(1/2)/c/e+b*
x*arcsin(c*x)/e-1/2*c*b*d/e*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln
((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_
R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/2*c*b*d/e*sum(_R1/(_R1^2*e
-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R
1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^2\arcsin(cx)+ax^2}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\,\mathrm{asin}\,(cx)\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.627 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx$

Optimal. Leaf size=491

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}-\frac{ib\text{PolyLog}\left(2,\cdots\right.}{2e}$$

```
[Out] ((-I/2)*(a + b*ArcSin[c*x])^2)/(b*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e) + ((a + b*Arc
Sin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) - ((I/2)*b*Po
lyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/
e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^
2*d + e])])/e - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e]))])/e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e
```

Rubi [A] time = 0.736162, antiderivative size = 491, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {4733, 4741, 4521, 2190, 2279, 2391}

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}-\frac{ib\text{PolyLog}\left(2,\cdots\right.}{2e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] ((-I/2)*(a + b*ArcSin[c*x])^2)/(b*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e) + ((a + b*Arc
Sin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) - ((I/2)*b*Po
lyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/
e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^
2*d + e])])/e - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e]))])/e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx=\int\left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx$$

$$=-\frac{\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{e}}+\frac{\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{e}}$$

$$=-\frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\sin^{-1}(cx)\right)}{2\sqrt{e}}+\frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\sin^{-1}(cx)\right)}{2\sqrt{e}}$$

$$=-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be}-\frac{i\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\sin^{-1}(cx)\right)}{2\sqrt{e}}-\frac{i\,\text{Subst}\left(\int\frac{e^{ix}(a+}{ic\sqrt{-d}+\sqrt{c^2d}}\right.}{2}$$

$$=-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be}+\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}+\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\right.}{2e}$$

$$=-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be}+\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}+\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\right.}{2e}$$

$$=-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be}+\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}+\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\right.}{2e}$$

Mathematica [A] time = 0.1421, size = 399, normalized size = 0.81

$$-\frac{i\left(b\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+b\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)+b\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+b\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+i\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] ((-I/2)*(b*ArcSin[c*x]^2 + I*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + I*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*
ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + I*b*ArcSin[c*x]*Log[1 - (
Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + I*b*ArcSin[c*x]
*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + I*a*L
og[d + e*x^2] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[
c^2*d + e])] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqr
t[c^2*d + e])] + b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sq
rt[c^2*d + e]))] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sq
rt[c^2*d + e])]))/e
```

Maple [C] time = 0.221, size = 2749, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

```
[Out] 1/2*I*b*arcsin(c*x)^2/(c^2*d+e)-1/4*I*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/
2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e+2*I*c^2*b*arcsin(c*x)^2*d/e^
3*(c^2*d*(c^2*d+e))^(1/2)+2*I*c^4*b*d^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/
2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)+5/4*I*c^2*b*poly
log(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))
/e*d/(c^2*d+e)+2*I*c^6*b*d^3*arcsin(c*x)^2/e^3/(c^2*d+e)+5/2*I*c^2*b*arcsin
(c*x)^2/e*d/(c^2*d+e)+4*I*c^4*b*d^2*arcsin(c*x)^2/e^2/(c^2*d+e)-1/8*I/c^2*b
*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2
)+e))/d/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+1/8*I/c^2*b*(c^2*d*(c^2*d+e))^(1/
2)/d/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(
c^2*d+e))^(1/2)+e))+1/4/c^2*b/d/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2*d*(c^2*d+e))^(1/
2)-1/4/c^2*b*(c^2*d*(c^2*d+e))^(1/2)/d/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+
(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))+I*c^2*b*polylo
g(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*d
/e^3*(c^2*d*(c^2*d+e))^(1/2)-2*c^6*b/e^3*d^3/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*
x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)-4*c^4*b/
e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+
e))^(1/2)+e))*arcsin(c*x)*d^2-5/2*c^2*b/e/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2
+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d-2*c^2*b/e
^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e
))*arcsin(c*x)*d*(c^2*d*(c^2*d+e))^(1/2)+I*c^6*b*d^3*polylog(2,e*(I*c*x+(-c
^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e)+I*b
*arcsin(c*x)^2/e^2*(c^2*d*(c^2*d+e))^(1/2)+1/2*I*b*polylog(2,e*(I*c*x+(-c^2
*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^2*(c^2*d*(c^2*d+e
))^(1/2)+2*c^4*b/e^3*d^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c
^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2*d*(c^2*d+e))^(1/2)-3/2*
I*c^2*b*d*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d
+e))^(1/2)+e))/e^2/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-I*c^4*b*d^2*polylog(2,
e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^3/(
c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-3*I*c^2*b*(c^2*d*(c^2*d+e))^(1/2)/e^2*d/(c
^2*d+e)*arcsin(c*x)^2-2*I*c^4*b*d^2*arcsin(c*x)^2/e^3/(c^2*d+e)*(c^2*d*(c^2
*d+e))^(1/2)+3*c^2*b/e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c
^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2*d*(c^2*d+e))^(1/2)*d+1/
```

```
2*a/e*ln(c^2*e*x^2+c^2*d)+1/2*b/e*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)-1/2*b/(c^2*d+e)*ln(1-e*(I*c*x
+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)-1
/2*I*b/e*sum((_R1^2*e-4*c^2*d-2*e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_
R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)
),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/4*I*b*polylog(2,e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/(c^2*d+e)-I*b/e*ar
csin(c*x)^2+2*c^4*b/e^3*d^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*
(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+2*c^2*b/e^2*ln(1-e*(I*c*x+(-c^2*x^2
+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d-1/2*b*(c^
2*d*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/
2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))+3/2*b/e/(c^2*d+e)*ln(1-e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*
(c^2*d*(c^2*d+e))^(1/2)-2*I*c^4*b*arcsin(c*x)^2*d^2/e^3-2*I*c^2*b*d*arcsin(
c*x)^2/e^2-I*c^2*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2
*d*(c^2*d+e))^(1/2)+e))/e^2*d-I*c^4*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2)
)^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*d^2/e^3-3/4*I*b*polylog(2,e*(I*c
*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))/e/(c^2*d+e)
*(c^2*d*(c^2*d+e))^(1/2)-I*b*(c^2*d*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(c*x
)^2+1/4*I*b*(c^2*d*(c^2*d+e))^(1/2)/e/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^
2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))-b/e^2*ln(1-e*(I*c*x+(-
c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(c^2
*d*(c^2*d+e))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$b\int \frac{x\arctan\left(cx, \sqrt{cx+1}\sqrt{-cx+1}\right)}{ex^2+d}\,dx + \frac{a\log\left(ex^2+d\right)}{2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] b*integrate(x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x^2 + d), x) +
1/2*a*log(e*x^2 + d)/e
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx\arcsin(cx) + ax}{ex^2+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x*arcsin(c*x) + a*x)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\operatorname{asin}(cx)\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x}{ex^2 + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d), x)
```

3.628 $\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx$

Optimal. Leaf size=541

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}}}{\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$

```
[Out] ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sq
rt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e
]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*S
qrt[e]) + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + ((I/
2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e])
```

Rubi [A] time = 0.739139, antiderivative size = 541, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4667, 4741, 4521, 2190, 2279, 2391}

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}}}{\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2),x]
```


```
[Out] ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sq
rt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e
]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*S
qrt[e]) + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + ((I/
2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e])
```


Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx = \int \left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx$$

$$= -\frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{-d}} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{-d}}$$

$$= -\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}}$$

$$= -\frac{i\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{i\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} -$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{\left(a+b\sin^{-1}\right.}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{\left(a+b\sin^{-1}\right.}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{\left(a+b\sin^{-1}\right.}{}$$

Mathematica [A] time = 0.41144, size = 490, normalized size = 0.91

$$\frac{-ib\sqrt{d}\text{PolyLog}\left(2, \frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right) + ib\sqrt{d}\text{PolyLog}\left(2, \frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-ic\sqrt{-d}}\right) + ib\sqrt{d}\text{PolyLog}\left(2, -\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right) - ib\sqrt{d}\text{PolyLog}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2),x]
```

```
[Out] (2*a*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - b*Sqrt[d]*ArcSin[c*x]*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + b*Sqrt[d]*Ar
cSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d
 + e])] + b*Sqrt[d]*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])] - b*Sqrt[d]*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - I*b*Sqrt[d]*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + I*b*Sqrt[d]*Pol
yLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] +
I*b*Sqrt[d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c
^2*d + e]))] - I*b*Sqrt[d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d^2]*Sqrt[e])
```

Maple [C] time = 0.062, size = 236, normalized size = 0.4

$$a\arctan\left(ex\frac{1}{\sqrt{de}}\right)\frac{1}{\sqrt{de}} + \frac{bc}{2}\sum_{\_R1=\text{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{1}{\_R1\left(\_R1^2e-2c^2d-e\right)}\left(i\arcsin(cx)\ln\left(\frac{1}{\_R1}\left(\_R1-icx\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d),x)
```

```
[Out] a/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/2*c*b*sum(1/_R1/(_R1^2*e-2*c^2*d-e)
*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c
^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*c*b*su
m(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/
_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d
-2*e)*_Z^2+e))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b \arcsin\left(cx\right) + a}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b \operatorname{asin}\left(cx\right)}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin\left(cx\right) + a}{ex^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

3.629 $\int \frac{a+b\sin^{-1}(cx)}{x(d+ex^2)}\,dx$

Optimal. Leaf size=518

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin}}{\sqrt{c^2d+e}}\right.}{2d}$$

```
[Out] -((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e])])/(2*d) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d) - ((a + b*ArcSin[c*x])*Log
[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d) -
 ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*d) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x]
)])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d - ((I/2)*b*Poly
Log[2, E^((2*I)*ArcSin[c*x])])/d
```

Rubi [A] time = 0.929586, antiderivative size = 518, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4733, 4625, 3717, 2190, 2279, 2391, 4741, 4521}

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin}}{\sqrt{c^2d+e}}\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e])])/(2*d) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d) - ((a + b*ArcSin[c*x])*Log
[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d) -
 ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*d) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x]
)])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d - ((I/2)*b*Poly
Log[2, E^((2*I)*ArcSin[c*x])])/d
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)}dx = \int\left(\frac{a+b\sin^{-1}(cx)}{dx}-\frac{ex\left(a+b\sin^{-1}(cx)\right)}{d\left(d+ex^2\right)}\right)dx$$
$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x}dx}{d}-\frac{e\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}dx}{d}$$
$$= \frac{\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\sin^{-1}(cx)\right)}{d}-\frac{e\int\left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{d}$$
$$= -\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bd}-\frac{(2i)\,\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}dx,x,\sin^{-1}(cx)\right)}{d}+\frac{\sqrt{e}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{2d}-\frac{\sqrt{e}\int\frac{a+b}{\sqrt{}}}{}$$
$$= -\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bd}+\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{b\,\text{Subst}\left(\int\log\left(1-e^{2ix}\right)dx,x,\text{si}\right.}{d}$$
$$= \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{(ib)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}dx,x,e^{2i\sin^{-1}(cx)}\right)}{2d}+\frac{\left(i\sqrt{e}\right)\text{Subst}\left(\int\right.}{}$$
$$= -\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{\left(a+b\sin^{-1}\right.}{}$$
$$= -\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{\left(a+b\sin^{-1}\right.}{}$$
$$= -\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{\left(a+b\sin^{-1}\right.}{}$$

Mathematica [A] time = 0.714418, size = 441, normalized size = 0.85

$$\frac{b\left(i\text{PolyLog}\left(2,\frac{\left(-2\sqrt{c^2d\left(c^2d+e\right)}+2c^2d+e\right)e^{2i\sin^{-1}(cx)}}{e}\right)+i\text{PolyLog}\left(2,\frac{\left(2\sqrt{c^2d\left(c^2d+e\right)}+2c^2d+e\right)e^{2i\sin^{-1}(cx)}}{e}\right)-2i\text{PolyLog}\left(2,e^{2i\sin^{-1}(cx)}\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] (a*Log[x])/d - (a*Log[d + e*x^2])/(2*d) + (b*((-4*I)*ArcSin[Sqrt[-((c^2*d)/
e)]]*ArcTan[(c*(c^2*d + e)*x)/(Sqrt[c^2*d*(c^2*d + e)]*Sqrt[1 - c^2*x^2])]
+ 4*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - 2*ArcSin[Sqrt[-((c^2*d)/e)
]]*Log[1 - ((2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x])
)/e] - 2*ArcSin[c*x]*Log[1 - ((2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^(
(2*I)*ArcSin[c*x]))/e] + 2*ArcSin[Sqrt[-((c^2*d)/e)]]*Log[1 - ((2*c^2*d + e
 + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] - 2*ArcSin[c*x]*Log
[1 - ((2*c^2*d + e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] -
 (2*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])] + I*PolyLog[2, ((2*c^2*d + e - 2*S
qrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + I*PolyLog[2, ((2*c^2*d
+ e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e]))/(4*d)
```

Maple [C] time = 0.158, size = 355, normalized size = 0.7

$$-\frac{a\ln\left(c^2ex^2+c^2d\right)}{2d}+\frac{a\ln(cx)}{d}+\frac{ib}{d}\text{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)+\frac{b\arcsin(cx)}{d}\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-\frac{ib}{d}\text{dilog}\left(1+ic\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d),x)
```

```
[Out] -1/2*a/d*ln(c^2*e*x^2+c^2*d)+a/d*ln(c*x)+I*b/d*dilog(I*c*x+(-c^2*x^2+1)^(1/
2))+b/d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b/d*dilog(1+I*c*x+(-c^
2*x^2+1)^(1/2))+1/4*I*b/d*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*ar
csin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2
+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/4*I*b*e/d*sum(
(_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/
2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c
^2*d-2*e)*_Z^2+e))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}a\left(\frac{\log\left(ex^2+d\right)}{d}-\frac{2\log\left(x\right)}{d}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{ex^3+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(e*x^2 + d)/d - 2*log(x)/d) + b*integrate(arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/(e*x^3 + d*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin\left(cx\right)+a}{ex^3+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e*x^3 + d*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\,\mathrm{asin}\left(cx\right)}{x\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{(ex^2 + d)x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x), x)
```

3.630 $\int \frac{a+b\sin^{-1}(cx)}{x^2(d+ex^2)}\,dx$

Optimal. Leaf size=579

$$\frac{ib\sqrt{e}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}-\frac{ib\sqrt{e}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}+\frac{ib\sqrt{e}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}-\frac{ib\sqrt{e}\text{Poly}}{}$$

```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (Sqrt[e
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(3/2))
+ (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqr
t[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Lo
g[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d
)^(3/2)) + ((I/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*S
qrt[-d] - Sqrt[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(3/2) + ((I
/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt
[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(3/2)
```

Rubi [A] time = 0.915763, antiderivative size = 579, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4733, 4627, 266, 63, 208, 4667, 4741, 4521, 2190, 2279, 2391}

$$\frac{ib\sqrt{e}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}-\frac{ib\sqrt{e}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}+\frac{ib\sqrt{e}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}-\frac{ib\sqrt{e}\text{Poly}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)),x]
```



```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (Sqrt[e
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(3/2))
+ (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqr
t[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Lo
g[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d
)^(3/2)) + ((I/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*S
qrt[-d] - Sqrt[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(3/2) + ((I
/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt
[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(3/2)
```


Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d+ex^2\right)}\,dx=\int\left(\frac{a+b\sin^{-1}(cx)}{dx^2}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{d\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\frac{a+b\sin^{-1}(cx)}{x^2}\,dx}{d}-\frac{e\int\frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{d}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}+\frac{(bc)\int\frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d}-\frac{e\int\left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{d}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}+\frac{(bc)\,\mathrm{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d}-\frac{e\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2(-d)^{3/2}}-\frac{e\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2(-d)^{3/2}}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{b\,\mathrm{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{cd}-\frac{e\,\mathrm{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\sin^{-1}\right.}{2(-d)^{3/2}}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}-\frac{(ie)\,\mathrm{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\sin^{-1}(cx)\right)}{2(-d)^{3/2}}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}-\ldots$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}-\ldots$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}-\ldots$$

Mathematica [A] time = 0.377149, size = 455, normalized size = 0.79

$$b\sqrt{e}x\left(2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)+2\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\ldots\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)),x]
```

```
[Out] (-4*a*Sqrt[d] - 4*a*Sqrt[e]*x*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - 4*b*Sqrt[d]*(Ar
cSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]) + b*Sqrt[e]*x*(ArcSin[c*x]*(Arc
Sin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2
*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e
])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d
 + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*
d + e]))]) - b*Sqrt[e]*x*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e
```

```
]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(4*d^(3/2)*x)
```

Maple [C] time = 0.511, size = 363, normalized size = 0.6

$$-\frac{ae}{d}\arctan\left(ex\frac{1}{\sqrt{de}}\right)\frac{1}{\sqrt{de}}-\frac{a}{dx}-\frac{b\arcsin(cx)}{dx}-\frac{be}{8cd^2}\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{4\_R1^2c^2d+\_R1^2e-e}{\_R1\left(\_R1^2e-2c^2d-e\right)}\left(i\,\mathrm{arcs}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(e*x^2+d),x)
```

```
[Out] -a*e/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-a/d/x-b/d*arcsin(c*x)/x-1/8*b/c/
d^2*e*sum((4*_R1^2*c^2*d+_R1^2*e-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*
ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))
/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/8*b/c/d^2*e*sum((_R1^2*e
-4*c^2*d-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+
1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4
+(-4*c^2*d-2*e)*_Z^2+e))+c*b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-c*b/d*ln(1+I*
c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\arcsin(cx)+a}{ex^4+dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e*x^4 + d*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\,\mathrm{asin}(cx)}{x^2\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*(d + e*x**2)), x)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.631 $\int \frac{a+b\sin^{-1}(cx)}{x^3(d+ex^2)}\,dx$

Optimal. Leaf size=573

$$-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,\right.}{2d^2}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) + (e*(a +
b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2
*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*
x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*Lo
g[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^2
) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/(2*d^2) - (e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/d^2 - ((I/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e]))])/d^2 - ((I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^2 - ((I/2)*b*e*PolyLog[2,
 -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^2 - ((
I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
+ e])])/d^2 + ((I/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rubi [A] time = 0.988345, antiderivative size = 573, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4733, 4627, 264, 4625, 3717, 2190, 2279, 2391, 4741, 4521}

$$-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,\right.}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) + (e*(a +
b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2
*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*
x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*Lo
g[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^2
) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/(2*d^2) - (e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/d^2 - ((I/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e]))])/d^2 - ((I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^2 - ((I/2)*b*e*PolyLog[2,
 -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^2 - ((
I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
+ e])])/d^2 + ((I/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)}dx = \int \left(\frac{a+b\sin^{-1}(cx)}{dx^3} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} + \frac{e^2x\left(a+b\sin^{-1}(cx)\right)}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^3}dx}{d} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{x}dx}{d^2} + \frac{e^2\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}dx}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}dx}{2d} - \frac{e\,\mathrm{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \sin^{-1}(cx)\right)}{d^2} + \frac{e^2\int \left(-\frac{a+}{2\sqrt{}}\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{ie\left(a+b\sin^{-1}(cx)\right)^2}{2bd^2} + \frac{(2ie)\,\mathrm{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}dx, x, \sin^{-1}(cx\right.}{d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{ie\left(a+b\sin^{-1}(cx)\right)^2}{2bd^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{(ibe)\,\mathrm{Subst}\left(\int \frac{\log(1-}{x}\right.}{2d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{e\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{e\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{e\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{}$$

Mathematica [A] time = 2.27454, size = 483, normalized size = 0.84

$$2b\left(-ie\mathrm{PolyLog}\left(2, \frac{\left(-2\sqrt{c^2d\left(c^2d+e\right)}+2c^2d+e\right)e^{2i\sin^{-1}(cx)}}{e}\right) - ie\mathrm{PolyLog}\left(2, \frac{\left(2\sqrt{c^2d\left(c^2d+e\right)}+2c^2d+e\right)e^{2i\sin^{-1}(cx)}}{e}\right) + 2ie\mathrm{PolyLog}\left(2, e^{2i\sin}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] ((-4*a*d)/x^2 - 8*a*e*Log[x] + 4*a*e*Log[d + e*x^2] + 2*b*((-2*c*d*Sqrt[1 -
 c^2*x^2])/x - (2*d*ArcSin[c*x])/x^2 + (4*I)*e*ArcSin[Sqrt[-((c^2*d)/e)]]*A
rcTan[(Sqrt[c^2*d*(c^2*d + e)]*x)/(c*d*Sqrt[1 - c^2*x^2])] - 4*e*ArcSin[c*x
]*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*e*ArcSin[Sqrt[-((c^2*d)/e)]]*Log[1 - (
(2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + 2*e*A
rcSin[c*x]*Log[1 - ((2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcS
in[c*x]))/e] - 2*e*ArcSin[Sqrt[-((c^2*d)/e)]]*Log[1 - ((2*c^2*d + e + 2*Sqr
t[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + 2*e*ArcSin[c*x]*Log[1 - (
(2*c^2*d + e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + (2*I)
*e*PolyLog[2, E^((2*I)*ArcSin[c*x])] - I*e*PolyLog[2, ((2*c^2*d + e - 2*Sqr
t[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] - I*e*PolyLog[2, ((2*c^2*d
+ e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e]))/(8*d^2)
```

Maple [C] time = 0.237, size = 419, normalized size = 0.7

$$\frac{ae\ln\left(c^2ex^2+c^2d\right)}{2d^2}-\frac{a}{2dx^2}-\frac{ae\ln(cx)}{d^2}+\frac{\frac{i}{2}c^2b}{d}-\frac{bc}{2dx}\sqrt{-c^2x^2+1}-\frac{b\arcsin(cx)}{2dx^2}-\frac{ibe}{d^2}\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)-\frac{b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d),x)
```

```
[Out] 1/2*a*e/d^2*ln(c^2*e*x^2+c^2*d)-1/2*a/d/x^2-a/d^2*e*ln(c*x)+1/2*I*c^2*b/d-1
/2*b*c*(-c^2*x^2+1)^(1/2)/d/x-1/2*b/d*arcsin(c*x)/x^2-I*b/d^2*e*dilog(I*c*x
+(-c^2*x^2+1)^(1/2))-b/d^2*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*b
/d^2*e*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/4*I*b/d^2*e*sum((_R1^2*e-4*c^2*d
-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R
1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2
*e)*_Z^2+e))-1/4*I*b/d^2*e^2*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*
x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/
2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{e\log\left(ex^2+d\right)}{d^2}-\frac{2e\log(x)}{d^2}-\frac{1}{dx^2}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{ex^5+dx^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(e*log(e*x^2 + d)/d^2 - 2*e*log(x)/d^2 - 1/(d*x^2)) + b*integrate(arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x^5 + d*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\arcsin(cx)+a}{ex^5+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e*x^5 + d*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\,\mathrm{asin}(cx)}{x^3\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**3*(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{(ex^2 + d)x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x^3), x)
```

3.632 $\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d+ex^2\right)}\,dx$

Optimal. Leaf size=649

$$\frac{ibe^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}-\frac{ibe^{3/2}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}+\frac{ibe^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}-\frac{ibe^{3/2}\text{Po}}{}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(6*d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) + (e*(a
+ b*ArcSin[c*x]))/(d^2*x) - (b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (b*c
*e*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 + (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 - (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/2)
) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*S
qrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + (e^(3/2)*(a + b*ArcSin[c*x])*
Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(
-d)^(5/2)) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + ((I/2)*b*e^(3/2)*Pol
yLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(
-d)^(5/2) - ((I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) + ((I/2)*b*e^(3/2)*PolyLog[2, -((Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(-d)^(5/2) - ((
I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
c^2*d + e])])/(-d)^(5/2)
```

Rubi [A] time = 0.962196, antiderivative size = 649, normalized size of antiderivative = 1., number of steps used = 29, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4733, 4627, 266, 51, 63, 208, 4667, 4741, 4521, 2190, 2279, 2391}

$$\frac{ibe^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}-\frac{ibe^{3/2}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}+\frac{ibe^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}-\frac{ibe^{3/2}\text{Po}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d + e*x^2)),x]
```


```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(6*d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) + (e*(a
+ b*ArcSin[c*x]))/(d^2*x) - (b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (b*c
*e*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 + (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 - (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/2)
) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*S
qrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + (e^(3/2)*(a + b*ArcSin[c*x])*
Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(
-d)^(5/2)) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + ((I/2)*b*e^(3/2)*Pol
yLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(
-d)^(5/2) - ((I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) + ((I/2)*b*e^(3/2)*PolyLog[2, -((Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(-d)^(5/2) - ((
I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
c^2*d + e])])/(-d)^(5/2)
```


Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
```

```
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
```

```
e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d+ex^2\right)}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{dx^4} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x^2} + \frac{e^2\left(a+b\sin^{-1}(cx)\right)}{d^2\left(d+ex^2\right)}\right) dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^4}\,dx}{d} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} + \frac{(bc)\int \frac{1}{x^3\sqrt{1-c^2x^2}}\,dx}{3d} - \frac{(bce)\int \frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d^2} + \frac{e^2\int \left(\frac{\sqrt{-\cdots}}{2\cdots}\right.}{\cdots}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} + \frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{x^2\sqrt{1-c^2x}}\,dx, x, x^2\right)}{6d} - \frac{(bce)\,\mathrm{Subst}\left(\int \frac{\cdots}{x\cdots}\right.}{2d\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} + \frac{\left(bc^3\right)\mathrm{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)}{12d} + \frac{(\cdots}{\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} + \frac{bce\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{(bc)\,\mathrm{Subst}\cdots}{\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} - \frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d} + \frac{bce\tanh^{-1}\cdots}{\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} - \frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d} + \frac{bce\tanh^{-1}\cdots}{\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2x} - \frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d} + \frac{bce\tanh^{-1}\cdots}{\cdots}$$

Mathematica [A] time = 0.4353, size = 531, normalized size = 0.82

$$b\left(-\frac{e^{3/2}\left(2\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\right.\right.\right.}{4d^{5/2}}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d + e*x^2)),x]
```

```
[Out] -a/(3*d*x^3) + (a*e)/(d^2*x) + (a*e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/d^(5
/2) + b*(-((e*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1 - c^2*x^2]]))/d^2) - (c*
x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(
6*d*x^3) - (e^(3/2)*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(
I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcS
in[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))/(4*d^(5/2)) + (e^(3/2)*(Ar
cSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sq
rt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
 + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d
] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
 + Sqrt[c^2*d + e])]))/(4*d^(5/2)))
```

Maple [C] time = 0.544, size = 472, normalized size = 0.7

$$\frac{ae^2}{d^2}\arctan\left(ex\frac{1}{\sqrt{de}}\right)\frac{1}{\sqrt{de}}-\frac{a}{3\,dx^3}+\frac{ae}{d^2x}-\frac{bc}{6\,dx^2}\sqrt{-c^2x^2+1}+\frac{b\arcsin(cx)\,e}{d^2x}-\frac{b\arcsin(cx)}{3\,dx^3}-\frac{be^2}{8\,cd^3}\sum_{\_R1=\text{RootOf}\left(e\_Z^4+(-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(e*x^2+d),x)
```

```
[Out] a*e^2/d^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/3*a/d/x^3+a/d^2*e/x-1/6*b*c
*(-c^2*x^2+1)^(1/2)/d/x^2+b*arcsin(c*x)/d^2*e/x-1/3*b*arcsin(c*x)/d/x^3-1/8
/c*b/d^3*e^2*sum((_R1^2*e-4*c^2*d-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)
*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2)
)/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/6*c^3*b/d*ln(I*c*x+(-c^
2*x^2+1)^(1/2)-1)-1/6*c^3*b/d*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/8/c*b/d^3*e^
2*sum((4*_R1^2*c^2*d+_R1^2*e-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((
_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1
)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-c*b/d^2*e*ln(I*c*x+(-c^2*x^2+1
)^(1/2)-1)+c*b/d^2*e*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin(cx)+a}{ex^6+dx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e*x^6 + d*x^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\,\text{asin}(cx)}{x^4\,(d+ex^2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**4*(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin(cx)+a}{(ex^2+d)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x^4), x)
```

3.633 $\int \frac{x^3(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=574

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i}}{\sqrt{c^2d}}\right.}{2e^2}$$

```
[Out] (d*(a + b*ArcSin[c*x]))/(2*e^2*(d + e*x^2)) - ((I/2)*(a + b*ArcSin[c*x])^2)
/(b*e^2) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^
2])])/(2*e^2*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c
*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])
/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) - ((I/2)*b*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])
/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
[c^2*d + e])])/e^2 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^2
```

Rubi [A] time = 0.956311, antiderivative size = 574, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4733, 4729, 377, 205, 4741, 4521, 2190, 2279, 2391}

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i}}{\sqrt{c^2d-}}\right.}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```



```
[Out] (d*(a + b*ArcSin[c*x]))/(2*e^2*(d + e*x^2)) - ((I/2)*(a + b*ArcSin[c*x])^2)
/(b*e^2) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^
2])])/(2*e^2*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c
*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])
/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) - ((I/2)*b*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])
/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
[c^2*d + e])])/e^2 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^2
```


Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx = \int\left(-\frac{dx\left(a+b\sin^{-1}(cx)\right)}{e\left(d+ex^2\right)^2}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{e} - \frac{d\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx}{e}$$

$$= \frac{d\left(a+b\sin^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)} - \frac{(bcd)\int \frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{2e^2} + \frac{\int\left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)}+\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right)dx}{e}$$

$$= \frac{d\left(a+b\sin^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)} - \frac{(bcd)\,\mathrm{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,dx, x, \frac{x}{\sqrt{1-c^2x^2}}\right)}{2e^2} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e^{3/2}} + \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}\ldots}}{2\ldots}$$

$$= \frac{d\left(a+b\sin^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)} - \frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} - \frac{\mathrm{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2e^{3/2}} + \ldots$$

$$= \frac{d\left(a+b\sin^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^2} - \frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} - \frac{i\,\mathrm{Subst}\left(\int \frac{e^{ix}(a+\ldots}{ic\sqrt{-d}-\sqrt{c^2d\ldots}}\right.}{2\ldots}$$

$$= \frac{d\left(a+b\sin^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^2} - \frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} + \frac{\left(a+b\sin^{-1}(cx)\right)\log\ldots}{2e^2\ldots}$$

$$= \frac{d\left(a+b\sin^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^2} - \frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} + \frac{\left(a+b\sin^{-1}(cx)\right)\log\ldots}{2e^2\ldots}$$

$$= \frac{d\left(a+b\sin^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^2} - \frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} + \frac{\left(a+b\sin^{-1}(cx)\right)\log\ldots}{2e^2\ldots}$$

Mathematica [A] time = 1.03385, size = 593, normalized size = 1.03

$$\frac{b\left(-i\left(2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)+2\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1\ldots\right.\right.\right.\right.\right.}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] ((2*a*d)/(d + e*x^2) + 2*a*Log[d + e*x^2] + b*(Sqrt[d]*(ArcSin[c*x]/(Sqrt[d
] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - I*Sqrt[d]*(-(ArcSin[c*x]/(I*Sqrt[d]
+ Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - I*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 +
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2
, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog
[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) - I*(Arc
Sin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqr
t[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
+ Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
```

```
 - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
+ Sqrt[c^2*d + e])]))/(4*e^2)
```

Maple [C] time = 0.523, size = 2907, normalized size = 5.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

```
[Out] -5/2*c^2*b*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))
^(1/2)+e))*arcsin(c*x)*d/e^2/(c^2*d+e)-2*I*c^2*b*arcsin(c*x)^2*d/e^4*(c^2*d
*(c^2*d+e))^(1/2)+5/4*I*c^2*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c
^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)*d+5/2*I*c^2*b*arcsin(c*x)^
2*d/e^2/(c^2*d+e)+4*I*c^4*b*arcsin(c*x)^2/e^3/(c^2*d+e)*d^2+2*I*c^6*b*d^3*a
rcsin(c*x)^2/e^4/(c^2*d+e)+2*I*c^4*b*d^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1
/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e)-I*c^2*b*polylog
(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*d/
e^4*(c^2*d*(c^2*d+e))^(1/2)+1/2*b*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^
2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^2-1/2*I*b/e^2*sum((_R1^2*e-
4*c^2*d-2*e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^
(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-
4*c^2*d-2*e)*_Z^2+e))-I*b*arcsin(c*x)^2/e^2-1/4*I*b*polylog(2,e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^2+1/2*a/e^2*ln(c
^2*e*x^2+c^2*d)+1/2*c^2*b*arcsin(c*x)/e^2*d/(c^2*e*x^2+c^2*d)+2*c^2*b*ln(1-
e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsi
n(c*x)/e^3*d+2*c^4*b*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*
(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^2/e^4+I*b*(c^2*d*(c^2*d+e))^(1/2)/e^2/(c
^2*d+e)*arcsin(c*x)^2-3/2*b*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*
(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^2/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/
2)+1/2*b*(c^2*d*(c^2*d+e))^(1/2)/e^2/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-
c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))-2*I*c^2*b*arcsin
(c*x)^2/e^3*d-2*I*c^4*b*arcsin(c*x)^2*d^2/e^4-I*c^4*b*polylog(2,e*(I*c*x+(-
c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*d^2/e^4-I*c^2*b*
polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)
+e))*d/e^3+1/2*I*b*(c^2*d*(c^2*d+e))^(1/2)/e^2/(c^2*d+e)*arctanh(1/4*(2*(I*
c*x+(-c^2*x^2+1)^(1/2))^2*e-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))+3/4*I*b*p
olylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+
e))/e^2/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-1/4*I*b*(c^2*d*(c^2*d+e))^(1/2)/e
^2/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^
2*d+e))^(1/2)+e))+I*c^6*b*d^3*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c
^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^4/(c^2*d+e)+2*c^2*b*ln(1-e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d/e^4*
(c^2*d*(c^2*d+e))^(1/2)-2*c^6*b*d^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*
c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^4/(c^2*d+e)-4*c^4*b*d^2*l
n(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*a
rcsin(c*x)/e^3/(c^2*d+e)+1/8*I/c^2*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))/d/e/(c^2*d+e)*(c^2*d*(c^2*d+e))^(
1/2)+3/2*I*c^2*b*d*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2
*d*(c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-1/8*I/c^2*b*(
c^2*d*(c^2*d+e))^(1/2)/e/d/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))-3*c^2*b*d*ln(1-e*(I*c*x+(-c^2*x^2
+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^3/(c^2*d+
e)*(c^2*d*(c^2*d+e))^(1/2)-2*c^4*b*d^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/
(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^4/(c^2*d+e)*(c^2*d*(c^
2*d+e))^(1/2)+1/4/c^2*b*(c^2*d*(c^2*d+e))^(1/2)/e/d/(c^2*d+e)*arcsin(c*x)*l
```

```
n(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e))-1
/4/c^2*b*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(
1/2)+e))*arcsin(c*x)/d/e/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+2*I*c^4*b*d^2*ar
csin(c*x)^2/e^4/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+3*I*c^2*b*arcsin(c*x)^2/e
^3/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)*d+I*c^4*b*d^2*polylog(2,e*(I*c*x+(-c^2
*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^4/(c^2*d+e)*(c^2*
d*(c^2*d+e))^(1/2)+b*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*
(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^3*(c^2*d*(c^2*d+e))^(1/2)+1/2*c^2*a/e^2*
d/(c^2*e*x^2+c^2*d)-1/2*I*b*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2
*d-2*(c^2*d*(c^2*d+e))^(1/2)+e))/e^3*(c^2*d*(c^2*d+e))^(1/2)+1/2*I*b*arcsin
(c*x)^2/e/(c^2*d+e)-I*b*arcsin(c*x)^2/e^3*(c^2*d*(c^2*d+e))^(1/2)+1/4*I*b*p
olylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+
e))/e/(c^2*d+e)-1/2*b*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(c^2*d
*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e/(c^2*d+e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{d}{e^3x^2+de^2}+\frac{\log\left(ex^2+d\right)}{e^2}\right)+b\int\frac{x^3\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(d/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/e^2) + b*integrate(x^3*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^3\arcsin\left(cx\right)+ax^3}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^3}{(ex^2 + d)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d)^2, x)
```

3.634 $\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=83

$$\frac{bc\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}e\sqrt{c^2d+e}}-\frac{a+b\sin^{-1}(cx)}{2e(d+ex^2)}$$

```
[Out] -(a + b*ArcSin[c*x])/(2*e*(d + e*x^2)) + (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(S
qrt[d]*Sqrt[1 - c^2*x^2])])/(2*Sqrt[d]*e*Sqrt[c^2*d + e])
```

Rubi [A] time = 0.0594234, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4729, 377, 205}

$$\frac{bc\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}e\sqrt{c^2d+e}}-\frac{a+b\sin^{-1}(cx)}{2e(d+ex^2)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -(a + b*ArcSin[c*x])/(2*e*(d + e*x^2)) + (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(S
qrt[d]*Sqrt[1 - c^2*x^2])])/(2*Sqrt[d]*e*Sqrt[c^2*d + e])
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx = -\frac{a+b\sin^{-1}(cx)}{2e\left(d+ex^2\right)} + \frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}\left(d+ex^2\right)}\,dx}{2e}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2e\left(d+ex^2\right)} + \frac{(bc)\,\text{Subst}\left(\int \frac{1}{d-\left(-c^2d-e\right)x^2}\,dx, x, \frac{x}{\sqrt{1-c^2x^2}}\right)}{2e}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2e\left(d+ex^2\right)} + \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2\sqrt{de}\sqrt{c^2d+e}}$$

Mathematica [A] time = 0.146604, size = 87, normalized size = 1.05

$$-\frac{\frac{a}{d+ex^2} - \frac{bc\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{\sqrt{d}\sqrt{c^2d+e}} + \frac{b\sin^{-1}(cx)}{d+ex^2}}{2e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -(a/(d + e*x^2) + (b*ArcSin[c*x])/(d + e*x^2) - (b*c*ArcTan[(Sqrt[c^2*d + e
]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(Sqrt[d]*Sqrt[c^2*d + e]))/(2*e)
```

Maple [B] time = 0.032, size = 414, normalized size = 5.

$$-\frac{c^2a}{2e\left(c^2ex^2+c^2d\right)} - \frac{c^2b\arcsin(cx)}{2e\left(c^2ex^2+c^2d\right)} + \frac{c^2b}{4e}\ln\left(\left(2\frac{c^2d+e}{e} + 2\frac{\sqrt{-c^2ed}}{e}\left(cx+\frac{\sqrt{-c^2ed}}{e}\right) + 2\sqrt{\frac{c^2d+e}{e}}\sqrt{-\left(cx+\frac{\sqrt{-c^2}}{e}\right.}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

```
[Out] -1/2*c^2*a/e/(c^2*e*x^2+c^2*d)-1/2*c^2*b/e/(c^2*e*x^2+c^2*d)*arcsin(c*x)+1/
4*c^2*b/e/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e+2*(-c^2*e*
d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x+(-c^2*e*d)
^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2
))/(c*x+(-c^2*e*d)^(1/2)/e))-1/4*c^2*b/e/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/
2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*
d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*
e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2*e*d)^(1/2)/e))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 2.71617, size = 830, normalized size = 10.

$$\left[-\frac{4\,ac^2d^2 + 4\,ade + \left(bcex^2 + bcd\right)\sqrt{-c^2d^2 - de}\log\left(\frac{\left(8\,c^4d^2+8\,c^2de+e^2\right)x^4-2\,\left(4\,c^2d^2+3\,de\right)x^2-4\,\sqrt{-c^2d^2-de}\sqrt{-c^2x^2+1}\left(\left(2\,c^2d+e\right)x^3-dx\right)+d^2}{e^2x^4+2\,dex^2+d^2}\right) +}{8\left(c^2d^3e + d^2e^2 + \left(c^2d^2e^2 + de^3\right)x^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] [-1/8*(4*a*c^2*d^2 + 4*a*d*e + (b*c*e*x^2 + b*c*d)*sqrt(-c^2*d^2 - d*e)*log
(((8*c^4*d^2 + 8*c^2*d*e + e^2)*x^4 - 2*(4*c^2*d^2 + 3*d*e)*x^2 - 4*sqrt(-c
^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^3 - d*x) + d^2)/(e^2*x^4
+ 2*d*e*x^2 + d^2)) + 4*(b*c^2*d^2 + b*d*e)*arcsin(c*x))/(c^2*d^3*e + d^2*e
^2 + (c^2*d^2*e^2 + d*e^3)*x^2), -1/4*(2*a*c^2*d^2 + 2*a*d*e + (b*c*e*x^2 +
 b*c*d)*sqrt(c^2*d^2 + d*e)*arctan(1/2*sqrt(c^2*d^2 + d*e)*sqrt(-c^2*x^2 +
1)*((2*c^2*d + e)*x^2 - d)/((c^4*d^2 + c^2*d*e)*x^3 - (c^2*d^2 + d*e)*x)) +
 2*(b*c^2*d^2 + b*d*e)*arcsin(c*x))/(c^2*d^3*e + d^2*e^2 + (c^2*d^2*e^2 + d
*e^3)*x^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a + b\operatorname{asin}\left(cx\right)\right)}{\left(d + ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\arcsin\left(cx\right) + a\right)x}{\left(ex^2 + d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d)^2, x)
```

3.635 $\int \frac{a+b\sin^{-1}(cx)}{x(d+ex^2)^2}\,dx$

Optimal. Leaf size=597

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{}}{\sqrt{c}}\right.}{2d^2}$$

```
[Out] (a + b*ArcSin[c*x])/(2*d*(d + e*x^2)) - (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sq
rt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x
])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(
2*d^2) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcS
in[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e
])])/(2*d^2) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^2 + (
(I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
 + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] - Sqrt[c^2*d + e])])/d^2 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*
x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^2 - ((I/2)*b*PolyL
og[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rubi [A] time = 1.00921, antiderivative size = 597, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4733, 4625, 3717, 2190, 2279, 2391, 4729, 377, 205, 4741, 4521}

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{}}{\sqrt{c}}\right.}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2),x]
```


```
[Out] (a + b*ArcSin[c*x])/(2*d*(d + e*x^2)) - (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sq
rt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x
])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(
2*d^2) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcS
in[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e
])])/(2*d^2) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^2 + (
(I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
 + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] - Sqrt[c^2*d + e])])/d^2 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*
x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^2 - ((I/2)*b*PolyL
og[2, E^((2*I)*ArcSin[c*x])])/d^2
```


Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
```

```
e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)^2}\,dx = \int\left(\frac{a+b\sin^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\sin^{-1}(cx)\right)}{d\left(d+ex^2\right)^2} - \frac{ex\left(a+b\sin^{-1}(cx)\right)}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} + \frac{\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \sin^{-1}(cx)\right)}{d^2} - \frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}\left(d+ex^2\right)}\,dx}{2d} - \frac{e\int\Big(-$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bd^2} - \frac{(2i)\,\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \sin^{-1}(cx)\right)}{d^2} - \frac{(bc)\,\text{Subst}}{}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bd^2} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} + \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-e^{2is}\right.}{d^2}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} + \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d^2} + \frac{(ib)\,\text{Subst}\Big(}{}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} - \frac{\left(a+b\sin\right.}{}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} - \frac{\left(a+b\sin\right.}{}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} - \frac{\left(a+b\sin^{-1}(cx)\right)\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} - \frac{\left(a+b\sin\right.}{}$$

Mathematica [F] time = 3.6245, size = 0, normalized size = 0.

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2), x]
```

Maple [C] time = 0.234, size = 491, normalized size = 0.8

$$\frac{ac^2}{2d\left(c^2ex^2+c^2d\right)}-\frac{a\ln\left(c^2ex^2+c^2d\right)}{2d^2}+\frac{a\ln\left(cx\right)}{d^2}+\frac{bc^2\arcsin\left(cx\right)}{2d\left(c^2ex^2+c^2d\right)}+\frac{\frac{i}{2}b}{d^2\left(c^2d+e\right)}\sqrt{c^2d\left(c^2d+e\right)}\mathrm{Artanh}\left(\frac{1}{4}\left(2\left(icx+\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x)
```

```
[Out] 1/2*a*c^2/d/(c^2*e*x^2+c^2*d)-1/2*a/d^2*ln(c^2*e*x^2+c^2*d)+a/d^2*ln(c*x)+1
/2*b*c^2*arcsin(c*x)/d/(c^2*e*x^2+c^2*d)+1/2*I*b*(c^2*d*(c^2*d+e))^(1/2)/d^
2/(c^2*d+e)*arctanh(1/4*(2*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-4*c^2*d-2*e)/(c^4
*d^2+c^2*d*e)^(1/2))+I*b/d^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+b/d^2*arcsin(c
*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b/d^2*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2)
)+1/4*I*b/d^2*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln
((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_
R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/4*I*b/d^2*e*sum((_R1^2-1)/
(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+d
ilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*
_Z^2+e))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{1}{dex^2+d^2}-\frac{\log\left(ex^2+d\right)}{d^2}+\frac{2\log\left(x\right)}{d^2}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{e^2x^5+2dex^3+d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(1/(d*e*x^2 + d^2) - log(e*x^2 + d)/d^2 + 2*log(x)/d^2) + b*integrate
(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^2*x^5 + 2*d*e*x^3 + d^2*x),
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\arcsin\left(cx\right)+a}{e^2x^5+2dex^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin (cx) + a}{\left(ex^2 + d\right)^2 x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)^2*x), x)
```

3.636 $\int \frac{a+b\sin^{-1}(cx)}{x^3(d+ex^2)^2}\,dx$

Optimal. Leaf size=632

$$-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}-\frac{ibe\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}-\frac{ibe\text{PolyLog}\left(2,\right.}{d^3}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d^2*x) - (a + b*ArcSin[c*x])/(2*d^2*x^2) - (e*(
a + b*ArcSin[c*x]))/(2*d^2*(d + e*x^2)) + (b*c*e*ArcTan[(Sqrt[c^2*d + e]*x)
/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqrt[c^2*d + e]) + (e*(a + b*ArcS
in[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e
])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (e*(a + b*ArcS
in[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e
])])/d^3 - (2*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 - (
I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e])])/d^3 - (I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(
I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (I*b*e*PolyLog[2, E^((
2*I)*ArcSin[c*x])])/d^3
```

Rubi [A] time = 1.0447, antiderivative size = 632, normalized size of antiderivative = 1., number of steps used = 30, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {4733, 4627, 264, 4625, 3717, 2190, 2279, 2391, 4729, 377, 205, 4741, 4521}

$$-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}-\frac{ibe\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}-\frac{ibe\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}-\frac{ibe\text{PolyLog}\left(2,\right.}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d^2*x) - (a + b*ArcSin[c*x])/(2*d^2*x^2) - (e*(
a + b*ArcSin[c*x]))/(2*d^2*(d + e*x^2)) + (b*c*e*ArcTan[(Sqrt[c^2*d + e]*x)
/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqrt[c^2*d + e]) + (e*(a + b*ArcS
in[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e
])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (e*(a + b*ArcS
in[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e
])])/d^3 - (2*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 - (
I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e])])/d^3 - (I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(
I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (I*b*e*PolyLog[2, E^((
2*I)*ArcSin[c*x])])/d^3
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)^2}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{d^2x^3} - \frac{2e\left(a+b\sin^{-1}(cx)\right)}{d^3x} + \frac{e^2x\left(a+b\sin^{-1}(cx)\right)}{d^2\left(d+ex^2\right)^2} + \frac{2e^2x\left(a+b\sin^{-1}(cx)\right)}{d^3\left(d+ex^2\right)}\right) d$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^3}dx}{d^2} - \frac{(2e)\int \frac{a+b\sin^{-1}(cx)}{x}dx}{d^3} + \frac{\left(2e^2\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}dx}{d^3} + \frac{e^2\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}dx}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}dx}{2d^2} - \frac{(2e)\,\text{Subst}\left(\int (a+bx)\cot(x)\,dx\right.}{d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} + \frac{ie\left(a+b\sin^{-1}(cx)\right)^2}{bd^3} + \frac{(4ie)\,\text{Subst}\left(\int\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} + \frac{ie\left(a+b\sin^{-1}(cx)\right)^2}{bd^3} + \frac{bce\tan^{-1}\left(\frac{\sqrt{}}{\sqrt{d}}\right.}{2d^{5/2}\sqrt{c^2d}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{2e\left(a+b\sin\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} + \frac{e\left(a+b\sin^{-}\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} + \frac{e\left(a+b\sin^{-}\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} + \frac{e\left(a+b\sin^{-}\right.}{}$$

Mathematica [F] time = 5.8612, size = 0, normalized size = 0.

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2), x]
```

Maple [C] time = 0.346, size = 679, normalized size = 1.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x)
```

```
[Out] -1/2*c^2*a*e/d^2/(c^2*e*x^2+c^2*d)+a*e/d^3*ln(c^2*e*x^2+c^2*d)-1/2*a/d^2/x^
2-2*a/d^3*e*ln(c*x)-1/2*I*b*(c^2*d*(c^2*d+e))^(1/2)/(c^2*d+e)/d^3*arctanh(1
/4*(2*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))*
e-2*I*b/d^3*e*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-1/2*c^3*b*x/(c^2*e*x^2+c^2*d)
/d^2*(-c^2*x^2+1)^(1/2)*e-1/2*c^3*b/x/(c^2*e*x^2+c^2*d)/d*(-c^2*x^2+1)^(1/2
)-c^2*b*arcsin(c*x)*e/d^2/(c^2*e*x^2+c^2*d)-1/2*c^2*b/x^2/(c^2*e*x^2+c^2*d)
/d*arcsin(c*x)-1/2*I*b/d^3*e^2*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(
c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(
1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*I*c^4*b/(c^2*e*x^
2+c^2*d)/d-2*b/d^3*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/2*I*b/d^3
*e*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x
-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=Ro
otOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*I*c^4*b*x^2/(c^2*e*x^2+c^2*d)/d^2*e
+2*I*b/d^3*e*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}a\left(\frac{2ex^2+d}{d^2ex^4+d^3x^2}-\frac{2e\log\left(ex^2+d\right)}{d^3}+\frac{4e\log\left(x\right)}{d^3}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{e^2x^7+2dex^5+d^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((2*e*x^2 + d)/(d^2*e*x^4 + d^3*x^2) - 2*e*log(e*x^2 + d)/d^3 + 4*e*
log(x)/d^3) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^2*x
^7 + 2*d*e*x^5 + d^2*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin\left(cx\right)+a}{e^2x^7+2dex^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^7 + 2*d*e*x^5 + d^2*x^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.637 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=787

$$\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}+\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}-\frac{3ib}{}$$

```
[Out] (a*x)/e^2 + (b*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*x*ArcSin[c*x])/e^2 - (d*(a +
 b*ArcSin[c*x]))/(4*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (d*(a + b*ArcSin[c*x]
))/(4*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*d*ArcTanh[(Sqrt[e] - c^2*Sqrt[
-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(5/2)*Sqrt[c^2*d + e]) +
(b*c*d*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2
])])/(4*e^(5/2)*Sqrt[c^2*d + e]) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2))
- (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2)) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])
*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*
e^(5/2)) - (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*e^(5/2)) + (((3*I)/4)*b*Sqrt[-d]*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/e^(5/2) - (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(5/2) + (((3*I)/4)*b*Sqrt[-d]*PolyLog[2,
 -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2)
- (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/e^(5/2)
```

Rubi [A] time = 2.02723, antiderivative size = 787, normalized size of antiderivative = 1., number of steps used = 49, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4733, 4619, 261, 4667, 4743, 725, 206, 4741, 4521, 2190, 2279, 2391}

$$\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}+\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}-\frac{3ib}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a*x)/e^2 + (b*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*x*ArcSin[c*x])/e^2 - (d*(a +
 b*ArcSin[c*x]))/(4*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (d*(a + b*ArcSin[c*x]
))/(4*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*d*ArcTanh[(Sqrt[e] - c^2*Sqrt[
-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(5/2)*Sqrt[c^2*d + e]) +
(b*c*d*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2
])])/(4*e^(5/2)*Sqrt[c^2*d + e]) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2))
- (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2)) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])
*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*
e^(5/2)) - (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*e^(5/2)) + (((3*I)/4)*b*Sqrt[-d]*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/e^(5/2) - (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(5/2) + (((3*I)/4)*b*Sqrt[-d]*PolyLog[2,
```

```
-((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2)
- (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/e^(5/2)
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(e*(m + 1)), x] -
Dist[(b*c*n)/(e*(m + 1)), Int[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1
))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}dx = \int \left(\frac{a+b\sin^{-1}(cx)}{e^2} + \frac{d^2\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)^2} - \frac{2d\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int\left(a+b\sin^{-1}(cx)\right)dx}{e^2} - \frac{(2d)\int\frac{a+b\sin^{-1}(cx)}{d+ex^2}dx}{e^2} + \frac{d^2\int\frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}dx}{e^2}$$

$$= \frac{ax}{e^2} + \frac{b\int\sin^{-1}(cx)\,dx}{e^2} - \frac{(2d)\int\left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e^2} + \frac{d^2\int\left(-\frac{e\left(a+b\sin\right.}{4d\left(\sqrt{-d}\right.}\right.}{}$$

$$= \frac{ax}{e^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{(bc)\int\frac{x}{\sqrt{1-c^2x^2}}dx}{e^2} - \frac{\sqrt{-d}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{e^2} - \frac{\sqrt{-d}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{e^2} -$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{\sqrt{-d}\,\mathrm{Subs}}{}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{\left(i\sqrt{-d}\right)\mathrm{Su}}{}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\tanh}{4e^5}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\tanh}{4e^5}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\tanh}{4e^5}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\tanh}{4e^5}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\sin^{-1}(cx)}{e^2} - \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d\left(a+b\sin^{-1}(cx)\right)}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\tanh}{4e^5}$$

Mathematica [A] time = 1.50994, size = 649, normalized size = 0.82

$$b\left(3\sqrt{d}\left(2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)+2\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\mathrm{l}\right.\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (8*a*Sqrt[e]*x + (4*a*d*Sqrt[e]*x)/(d + e*x^2) - 12*a*Sqrt[d]*ArcTan[(Sqrt[
e]*x)/Sqrt[d]] + b*((8*Sqrt[e]*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]))/c + (
2*I)*d*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sq
rt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])]))/Sqrt[c^2*d + e]) + 2*d*(ArcS
```

```
in[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(S
qrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + 3*Sqrt[d]*(ArcSin[c*
x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - S
qrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^
2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqr
t[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sq
rt[c^2*d + e]))]) - 3*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (S
qrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt
[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(8*e^(5/2))
```

Maple [C] time = 1.484, size = 1738, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

```
[Out] a*x/e^2+1/2*c^2*a/e^2*d*x/(c^2*e*x^2+c^2*d)-3/2*a/e^2*d/(d*e)^(1/2)*arctan(
e*x/(d*e)^(1/2))+1/2*c^2*b*arcsin(c*x)/e^2*d*x/(c^2*e*x^2+c^2*d)+c^3*b*(-(2
*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(
1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d^2/e^5+1/2*c*b*(-(
2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^
(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d/e^4+c^3*b*((2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d^2/e^5+1/2*c*b*((2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d/e^4-c^5*b*(-(2*c^2*d
-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^3*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^5/(c^2*d+e)-c^3*b*(
-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x
^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e
)+c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^
2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d/e^5*(c^
2*d*(c^2*d+e))^(1/2)-c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*
d^3*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2
)+e)*e)^(1/2))/e^5/(c^2*d+e)-c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e
)^(1/2)*d^2*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+
e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)-c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2
)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*
d+e))^(1/2)+e)*e)^(1/2))*d/e^5*(c^2*d*(c^2*d+e))^(1/2)+b*x*arcsin(c*x)/e^2+
b*(-c^2*x^2+1)^(1/2)/c/e^2-c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)
^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e
))^(1/2)-e)*e)^(1/2))/e^5/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-1/2*c*b*(-(2*c^
2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d*arctan(e*(I*c*x+(-c^2*x^2+1)^(1
/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)*(c^2*d
*(c^2*d+e))^(1/2)+c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^2
*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e
)*e)^(1/2))/e^5/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+1/2*c*b*((2*c^2*d+2*(c^2*
d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c
^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)*(c^2*d*(c^2*d+e))
^(1/2)-3/4*c*b/e^2*d*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I
*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R
1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3/4*c*b/e^2*d*sum(_R1/(_R1^2*e-2*c^
2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c
```

```
*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^4\arcsin(cx)+ax^4}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^4\,(a+b\,\text{asin}\,(cx))}{\left(d+ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(b\arcsin(cx)+a)x^4}{\left(ex^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(e*x^2 + d)^2, x)
```

3.638 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=745

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}\cdots}\right.}{4\sqrt{-d}e^{3/2}}$$

```
[Out] (a + b*ArcSin[c*x])/(4*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) - (a + b*ArcSin[c*x]
)/(4*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(3/2)*Sqrt[c^2*d + e]) - (b*
c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/
(4*e^(3/2)*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) - ((a +
 b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^
2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) -
((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sq
rt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I
/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e
])])/(Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I/4)*b*PolyLog[
2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]
*e^(3/2))
```

Rubi [A] time = 1.94327, antiderivative size = 745, normalized size of antiderivative = 1., number of steps used = 46, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4733, 4667, 4743, 725, 206, 4741, 4521, 2190, 2279, 2391}

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}\cdots}\right.}{4\sqrt{-d}e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a + b*ArcSin[c*x])/(4*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) - (a + b*ArcSin[c*x]
)/(4*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(3/2)*Sqrt[c^2*d + e]) - (b*
c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/
(4*e^(3/2)*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) - ((a +
 b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^
2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) -
((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sq
rt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I
/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e
])])/(Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I/4)*b*PolyLog[
2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]
```

```
*e^(3/2))
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(e*(m + 1)), x] -
Dist[(b*c*n)/(e*(m + 1)), Int[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1
))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx = \int\left(-\frac{d\left(a+b\sin^{-1}(cx)\right)}{e\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{e} - \frac{d\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx}{e}$$

$$= \frac{\int\left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e} - \frac{d\int\left(-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e\left(a+b\sin^{-1}\right.}{2d\left(-de-e^2\right.}\cdots\right.}{e}$$

$$= \frac{1}{4}\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx + \frac{1}{4}\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx + \frac{1}{2}\int \frac{a+b\sin^{-1}(cx)}{-de-e^2x^2}\,dx - \frac{\int \frac{a+b\sin^{-1}(cx}{\sqrt{-d}-\sqrt{e}x}}{2\sqrt{-d}e}\cdots$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{1}{2}\int\left(-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2de\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{-d}\left(a+b\sin\right.}{2de\left(\sqrt{-d}+\right.}\cdots\right.$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4e} - \frac{(bc}{}\cdots$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{}}{\sqrt{c^2d+e}\sqrt{1}}\right.}{4e^{3/2}\sqrt{c^2d+e}}\cdots$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{}}{\sqrt{c^2d+e}\sqrt{1}}\right.}{4e^{3/2}\sqrt{c^2d+e}}\cdots$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{}}{\sqrt{c^2d+e}\sqrt{1}}\right.}{4e^{3/2}\sqrt{c^2d+e}}\cdots$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{}}{\sqrt{c^2d+e}\sqrt{1}}\right.}{4e^{3/2}\sqrt{c^2d+e}}\cdots$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{}}{\sqrt{c^2d+e}\sqrt{1}}\right.}{4e^{3/2}\sqrt{c^2d+e}}\cdots$$

Mathematica [A] time = 1.17044, size = 603, normalized size = 0.81

$$b\left(-\frac{2\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+\sin^{-1}(cx)\left(\sin^{-1}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)\right)\right)}{\sqrt{d}}+\frac{2\text{PolyLog}\left(2,\frac{\sqrt{e}\ldots}{c\ldots}\right.\ldots}{\ldots}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] ((-4*a*Sqrt[e]*x)/(d + e*x^2) + (4*a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[d] +
 b*((-2*ArcSin[c*x])/(I*Sqrt[d] + Sqrt[e]*x) - (2*I)*(ArcSin[c*x]/(Sqrt[d]
+ I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (2*c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*
x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] - (ArcSin[c*x]*(Ar
cSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^
2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d +
e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*
d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2
*d + e]))])/Sqrt[d] + (ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(
I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])/Sqrt[d]))/(8*e^(3/2))
```

Maple [C] time = 0.645, size = 1677, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

```
[Out] -1/2*c^2*a/e*x/(c^2*e*x^2+c^2*d)+1/2*a/e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2)
)-1/2*c^2*b*arcsin(c*x)/e*x/(c^2*e*x^2+c^2*d)+1/4*c*b/e*sum(1/_R1/(_R1^2*e-
2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1
-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+
1/4*c*b/e*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^
2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z
^4+(-4*c^2*d-2*e)*_Z^2+e))+c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)
^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e
))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)+c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1
/2)+e)*e)^(1/2)*d*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(
c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+c^3*b*(-
(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)
^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)*d+1
/2*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c
^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2
*d+e)*(c^2*d*(c^2*d+e))^(1/2)-c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)
*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e)
)^(1/2)-e)*e)^(1/2))*d/e^4-c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(
1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/
2)-e)*e)^(1/2))/e^4*(c^2*d*(c^2*d+e))^(1/2)-1/2*c*b*(-(2*c^2*d-2*(c^2*d*(c^
2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*
(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3+c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e)
```

```
)^(1/2)+e)*e)^(1/2)*d^2*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c
^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)-c^3*b*((2*c^2*d+2*(c^2*d*(
c^2*d+e))^(1/2)+e)*e)^(1/2)*d*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*
d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1
/2)+c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+
(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c
^2*d+e)*d-1/2*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e
*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)
)/e^3/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))
^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*
(c^2*d+e))^(1/2)+e)*e)^(1/2))*d/e^4+c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)
+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d
+e))^(1/2)+e)*e)^(1/2))/e^4*(c^2*d*(c^2*d+e))^(1/2)-1/2*c*b*((2*c^2*d+2*(c^
2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c
^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^2 \arcsin(cx) + ax^2}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2\,(a + b\,\mathrm{asin}\,(cx))}{\left(d + ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.639 $\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=757

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i}}{\sqrt{c^2d}}\right.}{4(-d)^{3/2}\sqrt{e}}$$

```
[Out] -(a + b*ArcSin[c*x])/(4*d*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin[c
*x])/(4*d*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*ArcTanh[(Sqrt[e] - c^2*Sqr
t[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d + e]
) + (b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x
^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[
e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1
- (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(3
/2)*Sqrt[e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog[2
, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^(
3/2)*Sqrt[e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog[2, -((Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*Sqrt[
e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
c^2*d + e])])/((-d)^(3/2)*Sqrt[e])
```

Rubi [A] time = 0.99458, antiderivative size = 757, normalized size of antiderivative = 1., number of steps used = 26, number of rules used = 9, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4667, 4743, 725, 206, 4741, 4521, 2190, 2279, 2391}

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i}}{\sqrt{c^2d}}\right.}{4(-d)^{3/2}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^2,x]
```

```
[Out] -(a + b*ArcSin[c*x])/(4*d*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin[c
*x])/(4*d*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*ArcTanh[(Sqrt[e] - c^2*Sqr
t[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d + e]
) + (b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x
^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[
e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1
- (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(3
/2)*Sqrt[e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog[2
, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^(
3/2)*Sqrt[e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog[2, -((Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*Sqrt[
e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
```

```
c^2*d + e])])/((-d)^(3/2)*Sqrt[e])
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(e*(m + 1)), x] -
Dist[(b*c*n)/(e*(m + 1)), Int[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1
))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}dx = \int \left(-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{2d\left(-de-e^2x^2\right)}\right)dx$$

$$= -\frac{e\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx}{4d}-\frac{e\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx}{4d}-\frac{e\int \frac{a+b\sin^{-1}(cx)}{-de-e^2x^2}dx}{2d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}dx}{4d}-\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c}}}{4d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{4(-d)^{3/2}}+\frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{4(-d)^{3/2}}-\frac{(bc)\,\text{Subst}}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{-}}{\sqrt{c^2d+e}\sqrt{1-}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{-}}{\sqrt{c^2d+e}\sqrt{1-}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{-}}{\sqrt{c^2d+e}\sqrt{1-}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{-}}{\sqrt{c^2d+e}\sqrt{1-}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}+c^2\sqrt{-}}{\sqrt{c^2d+e}\sqrt{1-}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$

Mathematica [A] time = 1.69092, size = 591, normalized size = 0.78

$$\frac{1}{2}\left(\frac{b\left(\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)-\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right)-\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right)+i\sqrt{a}\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^2,x]
```

```
[Out] ((a*x)/(d^2 + d*e*x^2) + (a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(d^(3/2)*Sqrt[e])
+ (b*(I*Sqrt[d]*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e]
 + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) +
Sqrt[d]*(ArcSin[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*ArcTanh[(Sqrt[e] + I*c^2*
Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + I*ArcSi
```

```
n[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e]
)] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]) -
I*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d
+ e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]
) + PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] -
 PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] -
 PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))] +
 PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(2
*d^(3/2)*Sqrt[e]))/2
```

Maple [C] time = 0.547, size = 1687, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

```
[Out] 1/2*c^2*a*x/d/(c^2*e*x^2+c^2*d)+1/2*a/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))
+1/2*c^2*b*arcsin(c*x)*x/d/(c^2*e*x^2+c^2*d)-c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2
*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(
c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)*d-c^3*b*(-(2*c^2*d-2*(c^2
*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)*(c^2*d*(c^2*d+e))^
(1/2)-c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*
x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^
2*d+e)/e^2-1/2*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(
e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/
2))/d/(c^2*d+e)/e^2*(c^2*d*(c^2*d+e))^(1/2)+c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*
d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c
^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3+c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(
1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c
^2*d+e))^(1/2)-e)*e)^(1/2))/d/e^3*(c^2*d*(c^2*d+e))^(1/2)+1/2*c*b*(-(2*c^2*
d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))
/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d/e^2-c^5*b*((2*c^2*d+2*
(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((
2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)*d+c^3*b*((2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)*(c^2*d*(
c^2*d+e))^(1/2)-c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arcta
nh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(
1/2))/(c^2*d+e)/e^2+1/2*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)
*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e
)*e)^(1/2))/d/(c^2*d+e)/e^2*(c^2*d*(c^2*d+e))^(1/2)+c^3*b*((2*c^2*d+2*(c^2*
d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2
*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3-c*b*((2*c^2*d+2*(c^2*d*(c^2*d
+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^
2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/e^3*(c^2*d*(c^2*d+e))^(1/2)+1/2*c*b*((2
*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^
(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/e^2+1/4*c*b/d*sum
(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))
/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*
d-2*e)*_Z^2+e))+1/4*c*b/d*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R
1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1))
,_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b \arcsin(cx) + a}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b \operatorname{asin}(cx)}{\left(d + ex^2\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(ex^2 + d\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^2, x)
```

3.640 $\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=795

$$-\frac{3\sqrt{e}\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)\left(a+b\sin^{-1}(cx)\right)}{4(-d)^{5/2}}+\frac{3\sqrt{e}\log\left(\frac{e^{i\sin^{-1}(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)\left(a+b\sin^{-1}(cx)\right)}{4(-d)^{5/2}}-\frac{3\sqrt{e}\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(}}{i\sqrt{-dc}+\sqrt{dc}}\right.}{4(-d}$$

```
[Out] -((a + b*ArcSin[c*x])/(d^2*x)) + (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt
[-d] - Sqrt[e]*x)) - (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt[-d] + Sqrt[
e]*x)) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d + e]) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e]
 + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d
+ e]) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 - (3*Sqrt[e]*(a + b*ArcSin[c*x
])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(
4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - (3*Sqrt[e]*(a +
 b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^
2*d + e])])/(4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - ((
(3*I)/4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) - (((3*I)/
4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(5/2)
```

Rubi [A] time = 1.99793, antiderivative size = 795, normalized size of antiderivative = 1., number of steps used = 50, number of rules used = 14, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4733, 4627, 266, 63, 208, 4667, 4743, 725, 206, 4741, 4521, 2190, 2279, 2391}

$$-\frac{3\sqrt{e}\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)\left(a+b\sin^{-1}(cx)\right)}{4(-d)^{5/2}}+\frac{3\sqrt{e}\log\left(\frac{e^{i\sin^{-1}(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)\left(a+b\sin^{-1}(cx)\right)}{4(-d)^{5/2}}-\frac{3\sqrt{e}\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(}}{i\sqrt{-dc}+\sqrt{dc}}\right.}{4(-d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d^2*x)) + (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt
[-d] - Sqrt[e]*x)) - (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt[-d] + Sqrt[
e]*x)) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d + e]) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e]
 + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d
+ e]) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 - (3*Sqrt[e]*(a + b*ArcSin[c*x
])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(
4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - (3*Sqrt[e]*(a +
 b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^
2*d + e])])/(4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - ((
(3*I)/4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*
```

```
E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) - (((3*I)/
4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(5/2)
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(e*(m + 1)), x] -
Dist[(b*c*n)/(e*(m + 1)), Int[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1
))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d+ex^2\right)^2}dx = \int \left(\frac{a+b\sin^{-1}(cx)}{d^2x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{d\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^2}dx}{d^2} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}dx}{d^2} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}dx}{d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{(bc)\int \frac{1}{x\sqrt{1-c^2x^2}}dx}{d^2} - \frac{e\int \left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{d^2} - \frac{e\int \left(-\frac{e(a+}{4d(\sqrt{}}\right.}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}dx, x, x^2\right)}{2d^2} + \frac{e\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{2(-d)^{5/2}} + \frac{e\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{2(-d)^{5/2}} + -\frac{e}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{b\,\mathrm{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}dx, x, \sqrt{1-c^2}\right.}{cd^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d^2} + \frac{(ie)\,\mathrm{S}}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} -$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} -$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} -$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} -$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^2x} + \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} -$$

Mathematica [A] time = 1.47593, size = 672, normalized size = 0.85

$$\frac{b\left(3\sqrt{e}\left(2\mathrm{PolyLog}\left(2, \frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}-c\sqrt{d}}\right) + 2\mathrm{PolyLog}\left(2, -\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+c\sqrt{d}}\right) + \sin^{-1}(cx)\left(\sin^{-1}(cx) + 2i\left(\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right) + \log\right.\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] ((-8*a*Sqrt[d])/x - (4*a*Sqrt[d]*e*x)/(d + e*x^2) - 12*a*Sqrt[e]*ArcTan[(Sq
rt[e]*x)/Sqrt[d]] + b*((-2*I)*Sqrt[d]*Sqrt[e]*(ArcSin[c*x]/(Sqrt[d] + I*Sqr
t[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c
```

```
^2*x^2])])/Sqrt[c^2*d + e]) + 2*Sqrt[d]*Sqrt[e]*(-(ArcSin[c*x]/(I*Sqrt[d] +
 Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt
[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (8*Sqrt[d]*(ArcSin[c*x] + c*x*ArcTanh[S
qrt[1 - c^2*x^2]]))/x + 3*Sqrt[e]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1
+ (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqr
t[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sq
rt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -
((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) - 3*Sqrt[e]*(
ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*
Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])))/(8*d^(5/2))
```

Maple [C] time = 2.112, size = 1839, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x)
```

```
[Out] -1/2*a/d^2*e*c^2*x/(c^2*e*x^2+c^2*d)-3/2*a/d^2*e/(d*e)^(1/2)*arctan(e*x/(d*
e)^(1/2))-a/d^2/x-3/2*b*arcsin(c*x)/d^2*e*c^2*x/(c^2*e*x^2+c^2*d)-b*c^2/x*a
rcsin(c*x)/(c^2*e*x^2+c^2*d)/d+b*c^5*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e
)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e
))^(1/2)-e)*e)^(1/2))/(c^2*d+e)/e^2+b*c^3*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1
/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^
2*d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e^2*(c^2*d*(c^2*d+e))^(1/2)+b*c^3*(-
(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)
^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e+1/2
*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2
*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d^2/(c^2*d
+e)/e*(c^2*d*(c^2*d+e))^(1/2)-b*c^3*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)
*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e)
)^(1/2)-e)*e)^(1/2))/d/e^2-c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(
1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/
2)-e)*e)^(1/2))/d^2/e^2*(c^2*d*(c^2*d+e))^(1/2)-1/2*c*b*(-(2*c^2*d-2*(c^2*d
*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*
d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d^2/e+b*c^5*((2*c^2*d+2*(c^2*d*(c^
2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*
(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)/e^2-b*c^3*((2*c^2*d+2*(c^2*d
*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*
d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/(c^2*d+e)/e^2*(c^2*d*(c^2*d+e))^
(1/2)+b*c^3*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*
x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/(c
^2*d+e)/e-1/2*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e
*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)
)/d^2/(c^2*d+e)/e*(c^2*d*(c^2*d+e))^(1/2)-b*c^3*((2*c^2*d+2*(c^2*d*(c^2*d+e
))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*
d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/e^2+c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/
2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2
*d+e))^(1/2)+e)*e)^(1/2))/d^2/e^2*(c^2*d*(c^2*d+e))^(1/2)-1/2*c*b*((2*c^2*d
+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))
/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d^2/e+3/16*b/c/d^3*e*sum(
(_R1^2*e-4*c^2*d-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
```

```
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+c*b/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-c*b
/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/16*b/c/d^3*e*sum((4*_R1^2*c^2*d+_R1^2
*e-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/
2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c
^2*d-2*e)*_Z^2+e))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin(cx)+a}{e^2x^6+2\,dex^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^6 + 2*d*e*x^4 + d^2*x^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.641 $\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=705

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}-\frac{ib\text{PolyLog}\left(2,\ldots\right.}{2e^3}$$

```
[Out] (b*c*d*x*Sqrt[1 - c^2*x^2])/(8*e^2*(c^2*d + e)*(d + e*x^2)) - (d^2*(a + b*A
rcSin[c*x]))/(4*e^3*(d + e*x^2)^2) + (d*(a + b*ArcSin[c*x]))/(e^3*(d + e*x^
2)) - ((I/2)*(a + b*ArcSin[c*x])^2)/(b*e^3) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2
*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(e^3*Sqrt[c^2*d + e]) + (b*c*Sqrt[
d]*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(
8*e^3*(c^2*d + e)^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*
Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e
^3) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^3) - ((I/2)*b*PolyLo
g[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^3
 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*
d + e])])/e^3 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e]))])/e^3 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^3
```

Rubi [A] time = 1.09456, antiderivative size = 705, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4733, 4729, 382, 377, 205, 4741, 4521, 2190, 2279, 2391}

$$-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}-\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}-\frac{ib\text{PolyLog}\left(2,\ldots\right.}{2e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```


```
[Out] (b*c*d*x*Sqrt[1 - c^2*x^2])/(8*e^2*(c^2*d + e)*(d + e*x^2)) - (d^2*(a + b*A
rcSin[c*x]))/(4*e^3*(d + e*x^2)^2) + (d*(a + b*ArcSin[c*x]))/(e^3*(d + e*x^
2)) - ((I/2)*(a + b*ArcSin[c*x])^2)/(b*e^3) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2
*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(e^3*Sqrt[c^2*d + e]) + (b*c*Sqrt[
d]*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(
8*e^3*(c^2*d + e)^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*
Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e
^3) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^3) - ((I/2)*b*PolyLo
g[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^3
 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*
d + e])])/e^3 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e]))])/e^3 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^3
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 382

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)), I
nt[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q}, x
] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !LtQ
[q, -1]) && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx=\int\left(\frac{d^2x\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)^3}-\frac{2dx\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)^2}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx}{e^2}-\frac{(2d)\int\frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{e^2}+\frac{d^2\int\frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx}{e^2}$$

$$=-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}-\frac{(bcd)\int\frac{1}{\sqrt{1-c^2x^2}\left(d+ex^2\right)}\,dx}{e^3}+\frac{\left(bcd^2\right)\int\frac{}{\sqrt{1-c^2x^2}}}{4e^3}$$

$$=\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}-\frac{(bcd)\,\text{Subst}\left(\int\frac{}{d-(}\right.}{}$$

$$=\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}-\frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c^2d}}{\sqrt{d}\sqrt{1-}}\right.}{e^3\sqrt{c^2d+e}}$$

$$=\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^3}$$

$$=\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^3}$$

$$=\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^3}$$

$$=\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\sin^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}-\frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2be^3}$$

Mathematica [A] time = 6.48581, size = 973, normalized size = 1.38

$$-\frac{4ad^2}{\left(ex^2+d\right)^2}+\frac{16ad}{ex^2+d}+8a\log\left(ex^2+d\right)+b\left(\frac{id^{3/2}\log\left(\frac{e\sqrt{dc^2+e}\left(-i\sqrt{d}xc^2+\sqrt{e}+\sqrt{dc^2+e}\sqrt{1-c^2x^2}\right)}{c^3\left(d+i\sqrt{e}x\sqrt{d}\right)}\right)c^3}{\left(dc^2+e\right)^{3/2}}-\frac{id^{3/2}\log\left(\frac{e\sqrt{dc^2+e}\left(i\sqrt{d}xc^2+\sqrt{e}+\sqrt{dc^2+e}\sqrt{1-c^2x^2}\right)}{c^3\left(d-i\sqrt{d}\sqrt{e}x\right)}\right)c^3}{\left(dc^2+e\right)^{3/2}}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] ((-4*a*d^2)/(d + e*x^2)^2 + (16*a*d)/(d + e*x^2) + 8*a*Log[d + e*x^2] + b*(
(c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x)) +
(c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x)) + (7*
Sqrt[d]*ArcSin[c*x])/(Sqrt[d] - I*Sqrt[e]*x) - (d*ArcSin[c*x])/(Sqrt[d] + I
*Sqrt[e]*x)^2 + (7*Sqrt[d]*ArcSin[c*x])/(Sqrt[d] + I*Sqrt[e]*x) + (d*ArcSin
[c*x])/(I*Sqrt[d] + Sqrt[e]*x)^2 - (8*I)*ArcSin[c*x]^2 - (7*c*Sqrt[d]*ArcTa
n[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^
2*d + e] + ((7*I)*c*Sqrt[d]*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d
 + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + 8*ArcSin[c*x]*Log[1 + (Sqrt[e]
*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 8*ArcSin[c*x]*Log[1 +
(Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 8*ArcSin[c*
x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + 8*A
rcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]
)] + (I*c^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqr
t[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))])/(c^2*d +
 e)^(3/2) - (I*c^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*
x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))])/(
c^2*d + e)^(3/2) - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
- Sqrt[c^2*d + e])] - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqr
t[d]) + Sqrt[c^2*d + e])] - (8*I)*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/
(c*Sqrt[d] + Sqrt[c^2*d + e]))] - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(16*e^3)
```

Maple [C] time = 1.639, size = 5124, normalized size = 7.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}\,a\left(\frac{4\,dex^2+3\,d^2}{e^5x^4+2\,de^4x^2+d^2e^3}+\frac{2\,\log\left(ex^2+d\right)}{e^3}\right)+b\int\frac{x^5\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((4*d*e*x^2 + 3*d^2)/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3) + 2*log(e*x^2
+ d)/e^3) + b*integrate(x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^3
*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^5\arcsin\left(cx\right)+ax^5}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*arcsin(c*x) + a*x^5)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^5}{(ex^2 + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^5/(e*x^2 + d)^3, x)
```

3.642 $\int \frac{x^3(a+b\sin^{-1}(cx))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=153

$$\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}+\frac{bc\left(2c^2d+3e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8\sqrt{d}e^2\left(c^2d+e\right)^{3/2}}-\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{b\sin^{-1}(cx)}{4de^2}$$

```
[Out] -(b*c*x*Sqrt[1 - c^2*x^2])/(8*e*(c^2*d + e)*(d + e*x^2)) - (b*ArcSin[c*x])/
(4*d*e^2) + (x^4*(a + b*ArcSin[c*x]))/(4*d*(d + e*x^2)^2) + (b*c*(2*c^2*d +
 3*e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(8*Sqrt[d]*e
^2*(c^2*d + e)^(3/2))
```

Rubi [A] time = 0.193865, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {264, 4731, 12, 470, 523, 216, 377, 205}

$$\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}+\frac{bc\left(2c^2d+3e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8\sqrt{d}e^2\left(c^2d+e\right)^{3/2}}-\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{b\sin^{-1}(cx)}{4de^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] -(b*c*x*Sqrt[1 - c^2*x^2])/(8*e*(c^2*d + e)*(d + e*x^2)) - (b*ArcSin[c*x])/
(4*d*e^2) + (x^4*(a + b*ArcSin[c*x]))/(4*d*(d + e*x^2)^2) + (b*c*(2*c^2*d +
 3*e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(8*Sqrt[d]*e
^2*(c^2*d + e)^(3/2))
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> -Simp[(a*e^(2*n - 1)*(e*x)^(m - 2*n + 1)*(a + b*x^n)^
(p + 1)*(c + d*x^n)^(q + 1))/(b*n*(b*c - a*d)*(p + 1)), x] + Dist[e^(2*n)/(
```

```
b*n*(b*c - a*d)*(p + 1)), Int[(e*x)^(m - 2*n)*(a + b*x^n)^(p + 1)*(c + d*x^
n)^q*Simp[a*c*(m - 2*n + 1) + (a*d*(m - n + n*q + 1) + b*c*n*(p + 1))*x^n,
x], x], x] /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[b*c - a*d, 0] && IGtQ[n,
0] && LtQ[p, -1] && GtQ[m - n + 1, n] && IntBinomialQ[a, b, c, d, e, m, n,
p, q, x]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rubi steps

$$\int \frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx = \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-(bc)\int \frac{x^4}{4d\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}\,dx$$

$$= \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{(bc)\int \frac{x^4}{\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}\,dx}{4d}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}+\frac{(bc)\int \frac{d-2\left(c^2d+e\right)x^2}{\sqrt{1-c^2x^2}\left(d+ex^2\right)}\,dx}{8de\left(c^2d+e\right)}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4de^2}+\frac{\left(bc\left(2c^2d+3e\right)\right)\int -}{8e^2\left(c^2d\right.}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{b\sin^{-1}(cx)}{4de^2}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}+\frac{\left(bc\left(2c^2d+3e\right)\right)\text{Subst}\left(\int\right.}{8e^2\left(c\right.}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{b\sin^{-1}(cx)}{4de^2}+\frac{x^4\left(a+b\sin^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}+\frac{bc\left(2c^2d+3e\right)\tan^{-1}\left(\frac{\sqrt{c}}{\sqrt{d}\sqrt{}}\right.}{8\sqrt{d}e^2\left(c^2d+e\right)^{3/2}}$$

Mathematica [A] time = 0.537112, size = 152, normalized size = 0.99

$$\frac{-\frac{2a(d+2ex^2)+\frac{bcex\sqrt{1-c^2x^2}(d+ex^2)}{c^2d+e}}{(d+ex^2)^2}+\frac{bc(2c^2d+3e)\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{\sqrt{d}(c^2d+e)^{3/2}}-\frac{2b\sin^{-1}(cx)(d+2ex^2)}{(d+ex^2)^2}}{8e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (-(((b*c*e*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(c^2*d + e) + 2*a*(d + 2*e*x^2)
)/(d + e*x^2)^2) - (2*b*(d + 2*e*x^2)*ArcSin[c*x])/(d + e*x^2)^2 + (b*c*(2*
c^2*d + 3*e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(Sqrt
[d]*(c^2*d + e)^(3/2)))/(8*e^2)
```

Maple [B] time = 0.018, size = 1055, normalized size = 6.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x)
```

```
[Out] -1/2*c^2*a/e^2/(c^2*e*x^2+c^2*d)+1/4*c^4*a/e^2*d/(c^2*e*x^2+c^2*d)^2-1/2*c^
2*b*arcsin(c*x)/e^2/(c^2*e*x^2+c^2*d)+1/4*c^4*b*arcsin(c*x)/e^2*d/(c^2*e*x^
2+c^2*d)^2+3/16*c^2*b/e^2/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d
+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(
-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(
c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))-1/16*c^2*b/e^2/(c^2*d+e)/(c*x+
(-c^2*e*d)^(1/2)/e)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+
(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2)+1/16*c^2*b/e^3*(-c^2*e*d)^(1/2)/(c^2
*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2
*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e
*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1
/2)/e))-3/16*c^2*b/e^2/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)
/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c
*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2
*d+e)/e)^(1/2))/(c*x-(-c^2*e*d)^(1/2)/e))-1/16*c^2*b/e^2/(c^2*d+e)/(c*x-(-c
^2*e*d)^(1/2)/e)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c
^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2)-1/16*c^2*b/e^3*(-c^2*e*d)^(1/2)/(c^2*d+
e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*
d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)
^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2*e*d)^(1/2)
/e))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{(2ex^2+d)a}{4(e^4x^4+2de^3x^2+d^2e^2)}-\frac{\left((2ex^2+d)\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)+(e^4x^4+2de^3x^2+d^2e^2)\int\frac{\cdots}{c^4e^4x^8-c^2d^2e^2x^2+(2c^4de^3\cdots}\right.}{4(e^4x^4+2de^3x^2+\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(2*e*x^2 + d)*a/(e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2) - 1/4*((2*e*x^2 + d)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 4*(e^4*x^4 + 2*d*e^3*x^2 + d^
2*e^2)*integrate(1/4*(2*c*e*x^2 + c*d)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x +
 1))/(c^4*e^4*x^8 - c^2*d^2*e^2*x^2 + (2*c^4*d*e^3 - c^2*e^4)*x^6 + (c^4*d^
2*e^2 - 2*c^2*d*e^3)*x^4 + (c^2*e^4*x^6 + (2*c^2*d*e^3 - e^4)*x^4 - d^2*e^2
 + (c^2*d^2*e^2 - 2*d*e^3)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))*b/(e
^4*x^4 + 2*d*e^3*x^2 + d^2*e^2)
```

Fricas [B] time = 3.99899, size = 1891, normalized size = 12.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/32*(8*a*c^4*d^4 + 16*a*c^2*d^3*e + 8*a*d^2*e^2 + 16*(a*c^4*d^3*e + 2*a*
c^2*d^2*e^2 + a*d*e^3)*x^2 + (2*b*c^3*d^3 + 3*b*c*d^2*e + (2*b*c^3*d*e^2 +
3*b*c*e^3)*x^4 + 2*(2*b*c^3*d^2*e + 3*b*c*d*e^2)*x^2)*sqrt(-c^2*d^2 - d*e)*
log(((8*c^4*d^2 + 8*c^2*d*e + e^2)*x^4 - 2*(4*c^2*d^2 + 3*d*e)*x^2 - 4*sqrt
(-c^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^3 - d*x) + d^2)/(e^2*x
^4 + 2*d*e*x^2 + d^2)) + 8*(b*c^4*d^4 + 2*b*c^2*d^3*e + b*d^2*e^2 + 2*(b*c^
4*d^3*e + 2*b*c^2*d^2*e^2 + b*d*e^3)*x^2)*arcsin(c*x) + 4*sqrt(-c^2*x^2 + 1
)*((b*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x))/(c^4*d
^5*e^2 + 2*c^2*d^4*e^3 + d^3*e^4 + (c^4*d^3*e^4 + 2*c^2*d^2*e^5 + d*e^6)*x^
4 + 2*(c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2*e^5)*x^2), -1/16*(4*a*c^4*d^4 + 8*
a*c^2*d^3*e + 4*a*d^2*e^2 + 8*(a*c^4*d^3*e + 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2
 + (2*b*c^3*d^3 + 3*b*c*d^2*e + (2*b*c^3*d*e^2 + 3*b*c*e^3)*x^4 + 2*(2*b*c^
3*d^2*e + 3*b*c*d*e^2)*x^2)*sqrt(c^2*d^2 + d*e)*arctan(1/2*sqrt(c^2*d^2 + d
*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^2 - d)/((c^4*d^2 + c^2*d*e)*x^3 - (
c^2*d^2 + d*e)*x)) + 4*(b*c^4*d^4 + 2*b*c^2*d^3*e + b*d^2*e^2 + 2*(b*c^4*d^
3*e + 2*b*c^2*d^2*e^2 + b*d*e^3)*x^2)*arcsin(c*x) + 2*sqrt(-c^2*x^2 + 1)*((
b*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x))/(c^4*d^5*e
^2 + 2*c^2*d^4*e^3 + d^3*e^4 + (c^4*d^3*e^4 + 2*c^2*d^2*e^5 + d*e^6)*x^4 +
2*(c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2*e^5)*x^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^3}{\left(ex^2 + d\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d)^3, x)
```

3.643 $\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=133

$$-\frac{a+b\sin^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{bc\left(2c^2d+e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e\left(c^2d+e\right)^{3/2}}+\frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}$$

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2])/(8*d*(c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x
])/(4*e*(d + e*x^2)^2) + (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqr
t[d]*Sqrt[1 - c^2*x^2])])/(8*d^(3/2)*e*(c^2*d + e)^(3/2))
```

Rubi [A] time = 0.0953057, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {4729, 382, 377, 205}

$$-\frac{a+b\sin^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{bc\left(2c^2d+e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e\left(c^2d+e\right)^{3/2}}+\frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```


```
[Out] (b*c*x*Sqrt[1 - c^2*x^2])/(8*d*(c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x
])/(4*e*(d + e*x^2)^2) + (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqr
t[d]*Sqrt[1 - c^2*x^2])])/(8*d^(3/2)*e*(c^2*d + e)^(3/2))
```


Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 382

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)), I
nt[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q}, x
] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !LtQ
[q, -1]) && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx=-\frac{a+b\sin^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{(bc)\int\frac{1}{\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}\,dx}{4e}$$

$$=\frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{a+b\sin^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{\left(bc\left(2c^2d+e\right)\right)\int\frac{1}{\sqrt{1-c^2x^2}\left(d+ex^2\right)}\,dx}{8de\left(c^2d+e\right)}$$

$$=\frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{a+b\sin^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{\left(bc\left(2c^2d+e\right)\right)\text{Subst}\left(\int\frac{1}{d-\left(-c^2d-e\right)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{8de\left(c^2d+e\right)}$$

$$=\frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{a+b\sin^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{bc\left(2c^2d+e\right)\tan^{-1}\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e\left(c^2d+e\right)^{3/2}}$$

Mathematica [A] time = 0.57626, size = 141, normalized size = 1.06

$$\frac{1}{8}\left(\frac{\frac{bcx\sqrt{1-c^2x^2}\left(d+ex^2\right)}{d\left(c^2d+e\right)}-\frac{2a}{e}}{\left(d+ex^2\right)^2}+\frac{bc\left(2c^2d+e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{3/2}e\left(c^2d+e\right)^{3/2}}-\frac{2b\sin^{-1}(cx)}{e\left(d+ex^2\right)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((-2*a)/e + (b*c*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(d*(c^2*d + e)))/(d + e*
x^2)^2 - (2*b*ArcSin[c*x])/(e*(d + e*x^2)^2) + (b*c*(2*c^2*d + e)*ArcTan[(S
qrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(d^(3/2)*e*(c^2*d + e)^(3/2
)))/8
```

Maple [B] time = 0.012, size = 1017, normalized size = 7.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x)
```

```
[Out] -1/4*c^4*a/e/(c^2*e*x^2+c^2*d)^2-1/4*c^4*b/e/(c^2*e*x^2+c^2*d)^2*arcsin(c*x
)+1/16*c^2*b/e/d/(c^2*d+e)/(c*x-(-c^2*e*d)^(1/2)/e)*(-(c*x-(-c^2*e*d)^(1/2)
/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2)+1/16
*c^2*b/e^2/d*(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)
/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c
*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2
*d+e)/e)^(1/2))/(c*x-(-c^2*e*d)^(1/2)/e))+1/16*c^2*b/e/d/(-c^2*e*d)^(1/2)/(
(c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(
1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/
2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))
+1/16*c^2*b/e/d/(c^2*d+e)/(c*x+(-c^2*e*d)^(1/2)/e)*(-(c*x+(-c^2*e*d)^(1/2)/
e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2)-1/16*
```

```
c^2*b/e^2/d*(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/
e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*
x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*
d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))-1/16*c^2*b/e/d/(-c^2*e*d)^(1/2)/((
c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1
/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2
)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2*e*d)^(1/2)/e))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(\left(ce^3x^4+2\,cde^2x^2+cd^2e\right)\int\frac{e^{\left(\frac{1}{2}\,\log(cx+1)+\frac{1}{2}\,\log(-cx+1)\right)}}{c^4e^3x^8-c^2d^2ex^2+\left(2\,c^4de^2-c^2e^3\right)x^6+\left(c^4d^2e-2\,c^2de^2\right)x^4-\left(c^2e^3x^6+\left(2\,c^2de^2-e^3\right)x^4-d^2e+\left(c^2d^2e-2\,de^2\right)x^2\right)(cx+1)(cx-1)}\right.}{4\left(e^3x^4+2\,de^2x^2+d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(4*(c*e^3*x^4 + 2*c*d*e^2*x^2 + c*d^2*e)*integrate(1/4*e^(1/2*log(c*x
+ 1) + 1/2*log(-c*x + 1))/(c^4*e^3*x^8 - c^2*d^2*e*x^2 + (2*c^4*d*e^2 - c^2
*e^3)*x^6 + (c^4*d^2*e - 2*c^2*d*e^2)*x^4 + (c^2*e^3*x^6 + (2*c^2*d*e^2 - e
^3)*x^4 - d^2*e + (c^2*d^2*e - 2*d*e^2)*x^2)*e^(log(c*x + 1) + log(-c*x + 1
))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(e^3*x^4 + 2*d*e^2*
x^2 + d^2*e) - 1/4*a/(e^3*x^4 + 2*d*e^2*x^2 + d^2*e)
```

Fricas [B] time = 3.90244, size = 1604, normalized size = 12.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/32*(8*a*c^4*d^4 + 16*a*c^2*d^3*e + 8*a*d^2*e^2 + (2*b*c^3*d^3 + b*c*d^2
*e + (2*b*c^3*d*e^2 + b*c*e^3)*x^4 + 2*(2*b*c^3*d^2*e + b*c*d*e^2)*x^2)*sqr
t(-c^2*d^2 - d*e)*log(((8*c^4*d^2 + 8*c^2*d*e + e^2)*x^4 - 2*(4*c^2*d^2 + 3
*d*e)*x^2 - 4*sqrt(-c^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^3 -
d*x) + d^2)/(e^2*x^4 + 2*d*e*x^2 + d^2)) + 8*(b*c^4*d^4 + 2*b*c^2*d^3*e + b
*d^2*e^2)*arcsin(c*x) - 4*sqrt(-c^2*x^2 + 1)*((b*c^3*d^2*e^2 + b*c*d*e^3)*x
^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x))/(c^4*d^6*e + 2*c^2*d^5*e^2 + d^4*e^3 +
 (c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2*e^5)*x^4 + 2*(c^4*d^5*e^2 + 2*c^2*d^4*e
^3 + d^3*e^4)*x^2), -1/16*(4*a*c^4*d^4 + 8*a*c^2*d^3*e + 4*a*d^2*e^2 + (2*b
*c^3*d^3 + b*c*d^2*e + (2*b*c^3*d*e^2 + b*c*e^3)*x^4 + 2*(2*b*c^3*d^2*e + b
*c*d*e^2)*x^2)*sqrt(c^2*d^2 + d*e)*arctan(1/2*sqrt(c^2*d^2 + d*e)*sqrt(-c^2
*x^2 + 1)*((2*c^2*d + e)*x^2 - d)/((c^4*d^2 + c^2*d*e)*x^3 - (c^2*d^2 + d*e
)*x)) + 4*(b*c^4*d^4 + 2*b*c^2*d^3*e + b*d^2*e^2)*arcsin(c*x) - 2*sqrt(-c^2
*x^2 + 1)*((b*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x)
)/(c^4*d^6*e + 2*c^2*d^5*e^2 + d^4*e^3 + (c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2
*e^5)*x^4 + 2*(c^4*d^5*e^2 + 2*c^2*d^4*e^3 + d^3*e^4)*x^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin (cx) + a)x}{\left(ex^2 + d\right)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d)^3, x)
```

3.644 $\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=727

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{}}{\sqrt{c}}\right.}{2d^3}$$

```
[Out] -(b*c*e*x*Sqrt[1 - c^2*x^2])/(8*d^2*(c^2*d + e)*(d + e*x^2)) + (a + b*ArcSi
n[c*x])/(4*d*(d + e*x^2)^2) + (a + b*ArcSin[c*x])/(2*d^2*(d + e*x^2)) - (b*
c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqrt[
c^2*d + e]) - (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1
 - c^2*x^2])])/(8*d^(5/2)*(c^2*d + e)^(3/2)) - ((a + b*ArcSin[c*x])*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^3) - (
(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])*L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^
3) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 + ((I/2)*b*Po
lyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/
d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[
c^2*d + e])])/d^3 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 - ((I/2)*b*PolyLog[2, E^((
2*I)*ArcSin[c*x])])/d^3
```

Rubi [A] time = 1.13187, antiderivative size = 727, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4733, 4625, 3717, 2190, 2279, 2391, 4729, 382, 377, 205, 4741, 4521}

$$\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3}+\frac{ib\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{}}{\sqrt{c}}\right.}{2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3),x]
```

```
[Out] -(b*c*e*x*Sqrt[1 - c^2*x^2])/(8*d^2*(c^2*d + e)*(d + e*x^2)) + (a + b*ArcSi
n[c*x])/(4*d*(d + e*x^2)^2) + (a + b*ArcSin[c*x])/(2*d^2*(d + e*x^2)) - (b*
c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqrt[
c^2*d + e]) - (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1
 - c^2*x^2])])/(8*d^(5/2)*(c^2*d + e)^(3/2)) - ((a + b*ArcSin[c*x])*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^3) - (
(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])*L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^
3) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 + ((I/2)*b*Po
lyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/
d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[
c^2*d + e])])/d^3 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 - ((I/2)*b*PolyLog[2, E^((
```

```
2*I)*ArcSin[c*x])])/d^3
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 382

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)), I
nt[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q}, x
] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !LtQ
[q, -1]) && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)^3}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\sin^{-1}(cx)\right)}{d\left(d+ex^2\right)^3} - \frac{ex\left(a+b\sin^{-1}(cx)\right)}{d^2\left(d+ex^2\right)^2} - \frac{ex\left(a+b\sin^{-1}(cx)\right)}{d^3\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^3} - \frac{e\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx}{d^3} - \frac{e\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx}{d}$$

$$= \frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)} + \frac{\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \sin^{-1}(cx)\right)}{d^3} - \frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}(d+}}{2d^2}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)} + \frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bd^3} - \frac{(2i)\,\text{Subst}}{}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)} + \frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2}{2bd^3} - \frac{bc\tan^{-1}\left(\right.}{2d^{5/2}\sqrt{c}}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)} + \frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc\left(2c^2d\right.}{8c}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)} + \frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc\left(2c^2d\right.}{8c}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)} + \frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc\left(2c^2d\right.}{8c}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)} + \frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc\left(2c^2d\right.}{8c}$$

Mathematica [F] time = 6.62819, size = 0, normalized size = 0.

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3), x]
```

Maple [C] time = 0.461, size = 1379, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x)
```

```
[Out] 1/4*a*c^4/d/(c^2*e*x^2+c^2*d)^2+1/2*a*c^2/d^2/(c^2*e*x^2+c^2*d)+a/d^3*ln(c*
x)-1/2*a/d^3*ln(c^2*e*x^2+c^2*d)+1/8*I*b*c^6/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)+
1/2*b*c^6/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*x^2*e-1/8*b*c^5/d^2/(
c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)*x^3*e^2-1/8*b*c^5/d/(c^2*e*
x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)*x*e+1/2*b*c^4/d^2/(c^2*e*x^2+c^2*
d)^2/(c^2*d+e)*arcsin(c*x)*x^2*e^2+1/8*I*b*c^6/d^2/(c^2*e*x^2+c^2*d)^2/(c^2
*d+e)*x^4*e^2+1/4*I*b*c^6/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*x^2*e+3/4*b*c^6/(
c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)+3/4*b*c^4/d/(c^2*e*x^2+c^2*d)^2/(c
^2*d+e)*arcsin(c*x)*e+5/8*I*b*(c^2*d*(c^2*d+e))^(1/2)/d^3/(c^2*d+e)^2*arcta
nh(1/4*(2*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/
2))*e+3/4*I*b*c^2*(c^2*d*(c^2*d+e))^(1/2)/d^2/(c^2*d+e)^2*arctanh(1/4*(2*(I
*c*x+(-c^2*x^2+1)^(1/2))^2*e-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))+1/4*I*b*
c^2/d^2/(c^2*d+e)*e*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R
1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1))
,_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+I*b/d^3/(c^2*d+e)*e*dilog(I*c*x+
(-c^2*x^2+1)^(1/2))+b/d^3/(c^2*d+e)*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(
1/2))+I*b*c^2/d^2/(c^2*d+e)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+b*c^2/d^2/(c^2*
d+e)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b/d^3/(c^2*d+e)*e*dilog(1
+I*c*x+(-c^2*x^2+1)^(1/2))+1/4*I*b/d^3/(c^2*d+e)*e*sum((_R1^2*e-4*c^2*d-e)/
(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+d
ilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*
_Z^2+e))+1/4*I*b/d^3/(c^2*d+e)*e^2*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arc
sin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+
1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-I*b*c^2/d^2/(c^2*
d+e)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/4*I*b*c^2/d^2/(c^2*d+e)*sum((_R1^2
*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)
^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(
-4*c^2*d-2*e)*_Z^2+e))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}a\left(\frac{2\,ex^2+3\,d}{d^2e^2x^4+2\,d^3ex^2+d^4}-\frac{2\,\log\left(ex^2+d\right)}{d^3}+\frac{4\,\log\left(x\right)}{d^3}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((2*e*x^2 + 3*d)/(d^2*e^2*x^4 + 2*d^3*e*x^2 + d^4) - 2*log(e*x^2 + d)
/d^3 + 4*log(x)/d^3) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2*e*x^3 + d^3*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin\left(cx\right)+a}{e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2*e*x^3 + d^3*x),
 x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

3.645 $\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=783

$$-\frac{3ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4}-\frac{3ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4}-\frac{3ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4}-\frac{3ibe\,\text{PolyI}}{}$$

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d^3*x) + (b*c*e^2*x*Sqrt[1 - c^2*x^2])/(8*d^3*(
c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x])/(2*d^3*x^2) - (e*(a + b*ArcSi
n[c*x]))/(4*d^2*(d + e*x^2)^2) - (e*(a + b*ArcSin[c*x]))/(d^3*(d + e*x^2))
+ (b*c*e*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(d^(7/2)*
Sqrt[c^2*d + e]) + (b*c*e*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]
*Sqrt[1 - c^2*x^2])])/(8*d^(7/2)*(c^2*d + e)^(3/2)) + (3*e*(a + b*ArcSin[c*
x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/
(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 - (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^4) + (3*
e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*d^4) - (3*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSi
n[c*x])])/d^4 - (((3*I)/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
c*Sqrt[-d] - Sqrt[c^2*d + e]))])/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^4 - (((3*I)/2)*b*e*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])
/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
+ Sqrt[c^2*d + e])])/d^4 + (((3*I)/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
)/d^4
```

Rubi [A] time = 1.17488, antiderivative size = 783, normalized size of antiderivative = 1., number of steps used = 34, number of rules used = 14, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4733, 4627, 264, 4625, 3717, 2190, 2279, 2391, 4729, 382, 377, 205, 4741, 4521}

$$-\frac{3ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4}-\frac{3ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4}-\frac{3ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4}-\frac{3ibe\,\text{PolyI}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] -(b*c*Sqrt[1 - c^2*x^2])/(2*d^3*x) + (b*c*e^2*x*Sqrt[1 - c^2*x^2])/(8*d^3*(
c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x])/(2*d^3*x^2) - (e*(a + b*ArcSi
n[c*x]))/(4*d^2*(d + e*x^2)^2) - (e*(a + b*ArcSin[c*x]))/(d^3*(d + e*x^2))
+ (b*c*e*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(d^(7/2)*
Sqrt[c^2*d + e]) + (b*c*e*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]
*Sqrt[1 - c^2*x^2])])/(8*d^(7/2)*(c^2*d + e)^(3/2)) + (3*e*(a + b*ArcSin[c*
x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/
(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 - (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^4) + (3*
e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*d^4) - (3*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSi
n[c*x])])/d^4 - (((3*I)/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
```

```
c*Sqrt[-d] - Sqrt[c^2*d + e]))])/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^4 - (((3*I)/2)*b*e*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])
/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
+ Sqrt[c^2*d + e])])/d^4 + (((3*I)/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
)/d^4
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x]))/(2*e*(p + 1)), x]
 - Dist[(b*c)/(2*e*(p + 1)), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 382

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)), I
nt[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q}, x
] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !LtQ
[q, -1]) && NeQ[p, -1]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)^3}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{d^3x^3} - \frac{3e\left(a+b\sin^{-1}(cx)\right)}{d^4x} + \frac{e^2x\left(a+b\sin^{-1}(cx)\right)}{d^2\left(d+ex^2\right)^3} + \frac{2e^2x\left(a+b\sin^{-1}(cx)\right)}{d^3\left(d+ex^2\right)^2} + \frac{3e^2}{\cdots}\right.$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^3}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^4} + \frac{\left(3e^2\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx}{d^4} + \frac{\left(2e^2\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{d^3} + \cdots$$

$$= -\frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{d^3\left(d+ex^2\right)} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d^3} - \frac{(3e)\,\text{Subst}\left(\cdots\right.}{\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(\cdots\right.}{d^3\left(d+ex^2\right.\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(\cdots\right.}{d^3\left(d+ex^2\right.\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(\cdots\right.}{d^3\left(d+ex^2\right.\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(\cdots\right.}{d^3\left(d+ex^2\right.\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(\cdots\right.}{d^3\left(d+ex^2\right.\cdots}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\sin^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\sin^{-1}(\cdots\right.}{d^3\left(d+ex^2\right.\cdots}$$

Mathematica [F] time = 9.25876, size = 0, normalized size = 0.

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3), x]
```

Maple [C] time = 0.622, size = 1816, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x)
```

```
[Out] -3/4*I*b/d^4*e^2/(c^2*d+e)*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*a
rcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^
2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3/4*I*b/d^4*e^3
/(c^2*d+e)*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(
-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=Root
Of(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3*I*b/d^4*e^2/(c^2*d+e)*dilog(I*c*x+(-c^2
*x^2+1)^(1/2))-3*b/d^4*e^2/(c^2*d+e)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))-1/2*c^7*b/x/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)-1/2*c^6*b
/x^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)+3*I*b/d^4*e^2/(c^2*d+e)*dilo
g(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/2*a/d^3/x^2-1/2*c^4*b/x^2/d/(c^2*e*x^2+c^2*
d)^2/(c^2*d+e)*arcsin(c*x)*e-1/2*c^7*b/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-
c^2*x^2+1)^(1/2)*x^3*e^2-c^7*b/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)
^(1/2)*x*e-3/2*c^6*b/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*x^2*e^2-
3/8*c^5*b*x^3/d^3/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)*e^3-3/2*
c^4*b*x^2/d^3/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*e^3+I*c^8*b*x^2/d/(
c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e-7/8*c^5*b*x/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e
)*(-c^2*x^2+1)^(1/2)*e^2-1/2*c^5*b/x/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*
x^2+1)^(1/2)*e-5/4*I*c^2*b*(c^2*d*(c^2*d+e))^(1/2)/d^3/(c^2*d+e)^2*arctanh(
1/4*(2*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))
*e+1/2*I*c^8*b*x^4/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e^2+3/4*I*c^6*b*x^2/d^
2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e^2+3/8*I*c^6*b*x^4/d^3/(c^2*e*x^2+c^2*d)^2
/(c^2*d+e)*e^3-9/4*c^4*b/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*e^2-
9/4*c^6*b/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*e-3*c^2*b/d^3/(c^2*d+
e)*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3/8*I*c^6*b/d/(c^2*e*x^2+c^
2*d)^2/(c^2*d+e)*e+3*I*c^2*b/d^3*e/(c^2*d+e)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/
2))-3/4*I*c^2*b/d^3*e^2/(c^2*d+e)*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcs
in(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1
)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3*I*c^2*b/d^3/(c^2
*d+e)*e*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-3/4*I*c^2*b/d^3*e/(c^2*d+e)*sum((_R
1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2
+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^
4+(-4*c^2*d-2*e)*_Z^2+e))-9/8*I*b*(c^2*d*(c^2*d+e))^(1/2)/d^4/(c^2*d+e)^2*a
rctanh(1/4*(2*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)
^(1/2))*e^2+3/2*a*e/d^4*ln(c^2*e*x^2+c^2*d)-3*a/d^4*e*ln(c*x)-1/4*c^4*a*e/d
^2/(c^2*e*x^2+c^2*d)^2-c^2*a*e/d^3/(c^2*e*x^2+c^2*d)+1/2*I*c^8*b/(c^2*e*x^2
+c^2*d)^2/(c^2*d+e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a\left(\frac{6e^2x^4+9dex^2+2d^2}{d^3e^2x^6+2d^4ex^4+d^5x^2}-\frac{6e\log\left(ex^2+d\right)}{d^4}+\frac{12e\log(x)}{d^4}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{e^3x^9+3de^2x^7+3d^2ex^5+d^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*e^2*x^4 + 9*d*e*x^2 + 2*d^2)/(d^3*e^2*x^6 + 2*d^4*e*x^4 + d^5*x^
2) - 6*e*log(e*x^2 + d)/d^4 + 12*e*log(x)/d^4) + b*integrate(arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3
), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\arcsin(cx)+a}{e^3x^9+3de^2x^7+3d^2ex^5+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3
), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

3.646 $\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=1082

result too large to display

```
[Out] (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x)
) + (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] + Sqrt[e
]*x)) - (Sqrt[-d]*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)^2
) + (5*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (Sqrt[-d]
*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)^2) - (5*(a + b*Arc
Sin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*d*ArcTanh[(Sqrt[e]
- c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(5/2)*(c^2*d
+ e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sq
rt[1 - c^2*x^2])])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (b*c^3*d*ArcTanh[(Sqrt[e]
 + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(5/2)*(c^2*d
 + e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (3*(a + b*ArcSin[c*x])*L
og[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*S
qrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + (3*(a + b*Arc
Sin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e])])/(16*Sqrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + ((
(3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2)) + (((3*I
)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
 + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2))
```

Rubi [A] time = 3.38407, antiderivative size = 1082, normalized size of antiderivative = 1., number of steps used = 80, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4733, 4667, 4743, 731, 725, 206, 4741, 4521, 2190, 2279, 2391}

$$\frac{bd\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{5/2}\left(dc^2+e\right)^{3/2}}+\frac{bd\tanh^{-1}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{5/2}\left(dc^2+e\right)^{3/2}}-\frac{5b\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16e^{5/2}\sqrt{dc^2+e}}-\frac{5b\tanh^{-1}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right.}{16e^{5/2}\sqrt{dc^2+e}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x)
) + (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] + Sqrt[e
]*x)) - (Sqrt[-d]*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)^2
) + (5*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (Sqrt[-d]
*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)^2) - (5*(a + b*Arc
Sin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*d*ArcTanh[(Sqrt[e]
- c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(5/2)*(c^2*d
+ e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sq
rt[1 - c^2*x^2])])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (b*c^3*d*ArcTanh[(Sqrt[e]
 + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(5/2)*(c^2*d
 + e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*S
```

```
qrt[1 - c^2*x^2])])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (3*(a + b*ArcSin[c*x])*L
og[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*S
qrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + (3*(a + b*Arc
Sin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e])])/(16*Sqrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + ((
(3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2)) + (((3*I
)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
 + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2))
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(e*(m + 1)), x] -
Dist[(b*c*n)/(e*(m + 1)), Int[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1
))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 731

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[(c*d)/(c*d^2 + a*e^2), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
```

```
FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}dx=\int\left(\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)^3}-\frac{2d\left(a+b\sin^{-1}(cx)\right)}{e^2\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{e^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\frac{a+b\sin^{-1}(cx)}{d+ex^2}dx}{e^2}-\frac{(2d)\int\frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}dx}{e^2}+\frac{d^2\int\frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^3}dx}{e^2}$$

$$=\frac{\int\left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e^2}-\frac{(2d)\int\left(-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e(a+b\sin}{2d(-de}\right.}{e^2}$$

$$=-\frac{\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{2\sqrt{-d}e^2}-\frac{\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{2\sqrt{-d}e^2}-\frac{3\int\frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx}{16e}-\frac{3\int\frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx}{16e}-\frac{3\int\frac{a+b\sin}{-de-e}}{8e}$$

$$=-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2}-\frac{5\left(a+b\sin^{-1}(cx\right.}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}\right.}$$

$$=\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5\left(a\right.}{16e^{5/}}$$

$$=\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5\left(a\right.}{16e^{5/}}$$

$$=\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5\left(a\right.}{16e^{5/}}$$

$$=\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5\left(a\right.}{16e^{5/}}$$

$$=\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5\left(a\right.}{16e^{5/}}$$

$$=\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5\left(a\right.}{16e^{5/}}$$

Mathematica [A] time = 5.88264, size = 1014, normalized size = 0.94

$$\frac{bd\left(\log\left(\frac{e\sqrt{dc^2+e}\left(-i\sqrt{d}xc^2+\sqrt{e}+\sqrt{dc^2+e}\sqrt{1-c^2x^2}\right)}{c^3\left(d+i\sqrt{e}x\sqrt{d}\right)}\right)+\log(4)\right)c^3}{\left(dc^2+e\right)^{3/2}}+\frac{bd\left(\log\left(\frac{e\sqrt{dc^2+e}\left(i\sqrt{d}xc^2+\sqrt{e}+\sqrt{dc^2+e}\sqrt{1-c^2x^2}\right)}{c^3\left(d-i\sqrt{d}\sqrt{e}x\right)}\right)+\log(4)\right)c^3}{\left(dc^2+e\right)^{3/2}}-\frac{5b\tanh^{-1}\left(\frac{i\sqrt{d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{\sqrt{dc^2+e}}-\frac{ib\sqrt{d}\sqrt{e}}{\left(dc^2+e\right)(}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((-I)*b*c*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] +
Sqrt[e]*x)) + (I*b*c*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqr
```

```
t[d] + Sqrt[e]*x)) + (4*a*d*Sqrt[e]*x)/(d + e*x^2)^2 - (10*a*Sqrt[e]*x)/(d
+ e*x^2) + (I*b*Sqrt[d]*ArcSin[c*x])/(Sqrt[d] + I*Sqrt[e]*x)^2 + (I*b*Sqrt[
d]*ArcSin[c*x])/(I*Sqrt[d] + Sqrt[e]*x)^2 - (5*b*ArcSin[c*x])/(I*Sqrt[d] +
Sqrt[e]*x) + (6*a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[d] - (5*I)*b*(ArcSin[c*
x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^
2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (5*b*c*ArcTanh[(Sqrt[e] +
I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + ((
3*I)*b*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqr
t[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*
d + e])]))/Sqrt[d] - ((3*I)*b*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c
*Sqrt[d] + Sqrt[c^2*d + e])]))/Sqrt[d] + (b*c^3*d*(Log[4] + Log[(e*Sqrt[c^2
*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c
^3*(d + I*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) + (b*c^3*d*(Log[4] + Log
[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c
^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) + (3*b*PolyL
og[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])])/Sqrt[d] -
 (3*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e
])])/Sqrt[d] - (3*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + S
qrt[c^2*d + e]))])/Sqrt[d] + (3*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c
*Sqrt[d] + Sqrt[c^2*d + e])])/Sqrt[d])/(16*e^(5/2))
```

Maple [C] time = 1.096, size = 3107, normalized size = 2.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x)
```

```
[Out] -7/4*c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x
+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(
c^2*d+e)^2*(c^2*d*(c^2*d+e))^(1/2)*d+c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(
1/2)+e)*e)^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*
d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^5/(c^2*d+e)^2*(c^2*d*(c^2*d+e))^(1/2)-c^3
*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x
^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d/e^5/(c^2*d
+e)*(c^2*d*(c^2*d+e))^(1/2)-c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)
^(1/2)*d^2*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e
))^(1/2)+e)*e)^(1/2))/e^5/(c^2*d+e)^2*(c^2*d*(c^2*d+e))^(1/2)-5/8*c^6*b/e/(
c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x^3*d-3/8*c^6*b/e^2/(c^2*d+e)/(c^2
*e*x^2+c^2*d)^2*arcsin(c*x)*x*d^2+1/8*c^5*b/e/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2
*(-c^2*x^2+1)^(1/2)*x^2*d-3/8*c^4*b/e/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(
c*x)*x*d+c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I
*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d
/e^5/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+7/4*c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d
+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^
2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)^2*(c^2*d*(c^2*d+e))^(1/2)*d
-c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c
^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d^2/e^5/
(c^2*d+e)+c^7*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^3*arctanh
(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/
2))/e^5/(c^2*d+e)^2-c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*a
rctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*
e)^(1/2))*d^2/e^5/(c^2*d+e)+9/4*c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+
e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+
e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)^2*d^2+5/4*c^3*b*(-(2*c^2*d-2*(c^2*d*(c
```

```
^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2
*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*d-7/4*c^3*b*(-(2*c^2*
d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))
/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)*d+1/8*c^5*
b/e^2/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*d^2*(-c^2*x^2+1)^(1/2)+5/8*c*b*(-(2*c^2
*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*(c^2*d*
(c^2*d+e))^(1/2)-5/4*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*a
rctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*
e)^(1/2))/e^4/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-5/8*c*b*((2*c^2*d+2*(c^2*d*
(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d
+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)^2*(c^2*d*(c^2*d+e))^(
1/2)+5/4*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c
*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4
/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+9/4*c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^
(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(
c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)^2*d^2+5/4*c^3*b*((2*c^2*d+2*(c^2
*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)^2*d-7/4*c^3*b*((2*
c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(
1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)*d+c^7*
b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^3*arctan(e*(I*c*x+(-c^
2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^5/(c^2*
d+e)^2+3/8*a/e^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+3/16*c*b/e/(c^2*d+e)*s
um(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))
/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*
d-2*e)*_Z^2+e))+3/16*c*b/e/(c^2*d+e)*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsi
n(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)
^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-5/8*c^4*a/(c^2*e*x^
2+c^2*d)^2/e*x^3+3/16*c^3*b/e^2/(c^2*d+e)*d*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(
I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2
*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+3/16*c^3*b/e
^2/(c^2*d+e)*d*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c
^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf
(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-5/8*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2
)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*
d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)-5/8*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e)
)^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d
*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)-5/8*c^4*b/(c^2*d+e)/(c^2*e*x^2
+c^2*d)^2*arcsin(c*x)*x^3-3/8*c^4*a/(c^2*e*x^2+c^2*d)^2/e^2*d*x
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^4 \arcsin(cx) + ax^4}{e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^4}{(ex^2 + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(e*x^2 + d)^3, x)
```

3.647 $\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=1092

result too large to display

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
) - (a + b*ArcSin[c*x])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)^2) - (a
 + b*ArcSin[c*x])/(16*d*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin[c*x
])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)^2) + (a + b*ArcSin[c*x])/(16
*d*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c^3*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) +
(b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])
])/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - (b*c^3*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*
x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) + (
b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])]
)/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2))
 + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/
2)*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[
2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^
(3/2)*e^(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[2, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*e^
(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2))
```

Rubi [A] time = 2.61063, antiderivative size = 1092, normalized size of antiderivative = 1., number of steps used = 62, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4733, 4667, 4743, 731, 725, 206, 4741, 4521, 2190, 2279, 2391}

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{3/2}\left(dc^2+e\right)^{3/2}}-\frac{b\tanh^{-1}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{3/2}\left(dc^2+e\right)^{3/2}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16de^{3/2}\sqrt{dc^2+e}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16de^{3/2}\sqrt{dc^2+e}}+$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
) - (a + b*ArcSin[c*x])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)^2) - (a
 + b*ArcSin[c*x])/(16*d*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin[c*x
])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)^2) + (a + b*ArcSin[c*x])/(16
*d*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c^3*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) +
(b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])
])/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - (b*c^3*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*
x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) + (
b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])]
```

```
)/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2))
 + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/
2)*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[
2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^
(3/2)*e^(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[2, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*e^
(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2))
```

Rule 4733

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(e*(m + 1)), x] -
Dist[(b*c*n)/(e*(m + 1)), Int[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1
))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 731

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[(c*d)/(c*d^2 + a*e^2), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
```

```
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^3}dx = \int \left(-\frac{d\left(a+b\sin^{-1}(cx)\right)}{e\left(d+ex^2\right)^3}+\frac{a+b\sin^{-1}(cx)}{e\left(d+ex^2\right)^2}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}dx}{e} - \frac{d\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^3}dx}{e}$$

$$= \frac{\int \left(-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e\left(a+b\sin^{-1}(cx)\right)}{2d\left(-de-e^2x^2\right)}\right)dx}{e} - \frac{d\int \left(-\frac{e^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8(-d)^{3/2}\left(\sqrt{-d}\sqrt{e}-ex\right)^3}-\frac{3e\left(a+b\right.}{16d^2\left(\sqrt{\right.}}\right.}{}$$

$$= \frac{3\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx}{16d} + \frac{3\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx}{16d} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx}{4d} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx}{4d} + \frac{3\int \frac{a+b\ldots}{-d\ldots}}{\ldots}$$

$$= -\frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{a+b\sin^{-1}(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{a+\ldots}{16de^{3/\ldots}}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\ldots\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\ldots\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\ldots\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\ldots\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\ldots\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\ldots\right.}$$

Mathematica [A] time = 6.02878, size = 1064, normalized size = 0.97

$$\frac{ax}{8de\left(ex^2+d\right)} - \frac{ax}{4e\left(ex^2+d\right)^2} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{3/2}e^{3/2}} + b\left(\frac{i\left(\frac{\sin^{-1}(cx)}{i\sqrt{e}x+\sqrt{d}}-\frac{c\tan^{-1}\left(\frac{\sqrt{d}xc^2+i\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{dc^2+e}}\right)}{16de^{3/2}} - \frac{-\frac{\sin^{-1}(cx)}{\sqrt{e}x+i\sqrt{d}}-\frac{c\tanh^{-1}\left(\frac{i\sqrt{d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{dc^2+e}}}{16de^{3/2}} \ldots\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] -(a*x)/(4*e*(d + e*x^2)^2) + (a*x)/(8*d*e*(d + e*x^2)) + (a*ArcTan[(Sqrt[e]
*x)/Sqrt[d]])/(8*d^(3/2)*e^(3/2)) + b*(((I/16)*(ArcSin[c*x]/(Sqrt[d] + I*Sq
rt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 -
c^2*x^2])])/Sqrt[c^2*d + e]))/(d*e^(3/2)) - (-(ArcSin[c*x]/(I*Sqrt[d] + Sqr
t[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 -
 c^2*x^2])])/Sqrt[c^2*d + e])/(16*d*e^(3/2)) - ((I/16)*(-((c*Sqrt[1 - c^2*x
^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x))) - ArcSin[c*x]/(Sqrt[e]*((-I)
*Sqrt[d] + Sqrt[e]*x)^2) - (I*c^3*Sqrt[d]*(Log[4] + Log[(e*Sqrt[c^2*d + e]*
(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d +
I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3/2))))/(Sqrt[d]*e) + ((I/16
)*(-((c*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x))) - ArcSin[
c*x]/(Sqrt[e]*(I*Sqrt[d] + Sqrt[e]*x)^2) + (I*c^3*Sqrt[d]*(Log[4] + Log[(e*
Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x
^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3/2))))/(Sqr
t[d]*e) - (ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c
*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/
(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))
/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*
x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))])/(32*d^(3/2)*e^(3/2)) + (ArcSin[c*x]*(
ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sq
rt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2
*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^
2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2
*d + e])])/(32*d^(3/2)*e^(3/2)))
```

Maple [C] time = 1.247, size = 2259, normalized size = 2.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x)
```

```
[Out] 1/4*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-
c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/d/(
c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+1/8*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2
)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*
d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)^2/d/e^2*(c^2*d*(c^2*d+e))^(1/2)+1/8*c^4*
b*e/d/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x^3-1/8*c^6*b/e/(c^2*d+e)/(
c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x*d-1/4*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1
/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^
2*d+e))^(1/2)+e)*e)^(1/2))/e^3/d/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-1/8*c*b*
(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+
1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)^2/d/e
^2*(c^2*d*(c^2*d+e))^(1/2)-1/4*c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)
*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e)
)^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)^2*d-1/4*c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2*d
+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^
2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*d+1/8*c*b*(-(2*c^2*d-2*(c
^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*
c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^2/d/(c^2*d+e)+1/8*c*b*((2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^2/d/(c^2*d+e)-1/8*c^
5*b/e*d/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)-1/4*c^3*b*(-(2*c^2
*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*(c^2*d*
(c^2*d+e))^(1/2)+1/4*c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*
```

```
arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)
*e)^(1/2))/e^3/(c^2*d+e)^2*(c^2*d*(c^2*d+e))^(1/2)+1/16*c^3*b/e/(c^2*d+e)*s
um(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))
/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*
d-2*e)*_Z^2+e))+1/8*a/d/e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/8*c^4*a/(c^
2*e*x^2+c^2*d)^2/e*x+1/16*c*b/d/(c^2*d+e)*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*
arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x
^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/16*c*b/d/(c^
2*d+e)*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1
)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+
(-4*c^2*d-2*e)*_Z^2+e))+1/16*c^3*b/e/(c^2*d+e)*sum(1/_R1/(_R1^2*e-2*c^2*d-e
)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/8*c^4*a
/(c^2*e*x^2+c^2*d)^2/d*x^3+1/4*c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)
*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e)
)^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)+1/8*c^6*b/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*
arcsin(c*x)*x^3-1/8*c^5*b/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)*
x^2-1/8*c^4*b/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x-1/4*c^3*b*(-(2*c^
2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2
))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)^2/e^2-1/4*c^
3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*
x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)^2/
e^2+1/4*c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*
c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e
^3/(c^2*d+e)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^2 \arcsin(cx) + ax^2}{e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)x^2}{(ex^2 + d)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(e*x^2 + d)^3, x)
```

3.648 $\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=1092

result too large to display

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
) - (a + b*ArcSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)^2) -
(3*(a + b*ArcSin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*Ar
cSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)^2) + (3*(a + b*Arc
Sin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*ArcTanh[(Sqrt[e
] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e]*(c^
2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e
]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (b*c^3*ArcTanh[(S
qrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e
]*(c^2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*
d + e]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (3*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e])
 + (3*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[
1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e])
```

Rubi [A] time = 1.24787, antiderivative size = 1092, normalized size of antiderivative = 1., number of steps used = 34, number of rules used = 10, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4667, 4743, 731, 725, 206, 4741, 4521, 2190, 2279, 2391}

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16d\sqrt{e}\left(dc^2+e\right)^{3/2}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16d\sqrt{e}\left(dc^2+e\right)^{3/2}}+\frac{3b\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16d^2\sqrt{e}\sqrt{dc^2+e}}+\frac{3b\tanh^{-1}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16d^2\sqrt{e}\sqrt{dc^2+e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
) - (a + b*ArcSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)^2) -
(3*(a + b*ArcSin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*Ar
cSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)^2) + (3*(a + b*Arc
Sin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*ArcTanh[(Sqrt[e
] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e]*(c^
2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e
]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (b*c^3*ArcTanh[(S
qrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e
]*(c^2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*
```

```
d + e]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (3*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e])
 + (3*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[
1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e])
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(e*(m + 1)), x] -
Dist[(b*c*n)/(e*(m + 1)), Int[((d + e*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1
))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 731

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[(c*d)/(c*d^2 + a*e^2), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
```

```
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^3}\,dx = \int \left(-\frac{e^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8(-d)^{3/2}\left(\sqrt{-d}\sqrt{e}-ex\right)^3} - \frac{3e\left(a+b\sin^{-1}(cx)\right)}{16d^2\left(\sqrt{-d}\sqrt{e}-ex\right)^2} - \frac{e^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8(-d)^{3/2}\left(\sqrt{-d}\sqrt{e}+ex\right)^3} - \frac{3e\left(a+b\sin^{-1}\right.}{16d^2\left(\sqrt{-d}\sqrt{e}\right.} \cdots$$

$$= -\frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx}{16d^2} - \frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx}{16d^2} - \frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{-de-e^2x^2}dx}{8d^2} - \frac{e^{3/2}\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^3}dx}{8(-d)^{3/2}} - \cdots$$

$$= -\frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{3\left(a+b\sin^{-1}(cx)\right)}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{3\left(a+b\right.}{16d^2\sqrt{e}\left(\right.} \cdots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right.} \cdots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right.} \cdots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right.} \cdots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right.} \cdots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right.} \cdots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right.} \cdots$$

Mathematica [A] time = 6.06254, size = 1055, normalized size = 0.97

$$\frac{3ax}{8d^2\left(ex^2+d\right)} + \frac{ax}{4d\left(ex^2+d\right)^2} + \frac{3a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{5/2}\sqrt{e}} + b\left(\frac{3i\left(\frac{\sin^{-1}(cx)}{i\sqrt{e}x+\sqrt{d}} - \frac{c\tan^{-1}\left(\frac{\sqrt{d}xc^2+i\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{dc^2+e}}\right)}{16d^2\sqrt{e}} - \frac{3\left(-\frac{\sin^{-1}(cx)}{\sqrt{e}x+i\sqrt{d}} - \frac{c\tanh^{-1}\left(\frac{i\sqrt{d}xc^2+\cdots}{\sqrt{dc^2+e}\sqrt{1-\cdots}}\right)}{\sqrt{dc^2+e}}\right)}{16d^2\sqrt{e}} \cdots\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^3,x]
```

```
[Out] (a*x)/(4*d*(d + e*x^2)^2) + (3*a*x)/(8*d^2*(d + e*x^2)) + (3*a*ArcTan[(Sqrt
[e]*x)/Sqrt[d]])/(8*d^(5/2)*Sqrt[e]) + b*((((3*I)/16)*(ArcSin[c*x]/(Sqrt[d]
 + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sq
rt[1 - c^2*x^2])])/Sqrt[c^2*d + e]))/(d^2*Sqrt[e]) - (3*(-(ArcSin[c*x]/(I*S
qrt[d] + Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d +
 e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]))/(16*d^2*Sqrt[e]) + ((I/16)*(-((c
```

```
*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x))) - ArcSin[c*x]
/(Sqrt[e]*((-I)*Sqrt[d] + Sqrt[e]*x)^2) - (I*c^3*Sqrt[d]*(Log[4] + Log[(e*S
qrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^
2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3/2))))/d^(3/
2) - ((I/16)*(-((c*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x))
) - ArcSin[c*x]/(Sqrt[e]*(I*Sqrt[d] + Sqrt[e]*x)^2) + (I*c^3*Sqrt[d]*(Log[4
] + Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3
/2))))/d^(3/2) - (3*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(
I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcS
in[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))/(32*d^(5/2)*Sqrt[e]) + (3*
(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c
*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqr
t[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] + Sqrt[c^2*d + e])]))/(32*d^(5/2)*Sqrt[e]))
```

Maple [C] time = 0.734, size = 3110, normalized size = 2.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^3,x)
```

```
[Out] 3/8*a/d^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-c^5*b*(-(2*c^2*d-2*(c^2*d*(c^
2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*
(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*(c^2*d*(c^2*d+e))^(1/2
)+c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-
c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2
*d+e)^2*(c^2*d*(c^2*d+e))^(1/2)-c^7*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e
)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e
))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)^2*d-c^7*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e)
)^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d
*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*d+5/4*c^3*b*(-(2*c^2*d-2*(c^
2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c
^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^2/d/(c^2*d+e)+5/4*c^3*b*((2*c
^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1
/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^2/d/(c^2*d+e)-3/4*c
^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2
*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/(c^2*d+e)
^2/e+3/8*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c
*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e/d
^2/(c^2*d+e)-3/4*c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arc
tan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)
^(1/2))/d/(c^2*d+e)^2/e+3/8*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^
(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1
/2)-e)*e)^(1/2))/e/d^2/(c^2*d+e)+3/8*c*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2
)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*
d+e))^(1/2)+e)*e)^(1/2))/d^2/(c^2*d+e)^2/e*(c^2*d*(c^2*d+e))^(1/2)-3/4*c*b*
((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+
1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^2/d^2/(c^2*d+e
)*(c^2*d*(c^2*d+e))^(1/2)+c^3*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^
(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1
/2)-e)*e)^(1/2))/e^3/d/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)+5/4*c^3*b*((2*c^2*
```

```
d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)^2/d/e^2*(c^2*d
*(c^2*d+e))^(1/2)-c^3*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arc
tanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)
^(1/2))/e^3/d/(c^2*d+e)*(c^2*d*(c^2*d+e))^(1/2)-5/4*c^3*b*(-(2*c^2*d-2*(c^2
*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^
2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)^2/d/e^2*(c^2*d*(c^2*d+
e))^(1/2)+3/8*c^6*b*e/d/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x^3+1/8*c
^5*b/d/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)*x^2*e+3/8*c^4*b/d^2
/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x^3*e^2+5/8*c^4*b/d/(c^2*d+e)/(c
^2*e*x^2+c^2*d)^2*arcsin(c*x)*x*e-3/8*c*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1
/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^
2*d+e))^(1/2)-e)*e)^(1/2))/d^2/(c^2*d+e)^2/e*(c^2*d*(c^2*d+e))^(1/2)+3/4*c*
b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^
2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^2/d^2/(c^2*
d+e)*(c^2*d*(c^2*d+e))^(1/2)+3/16*c^3*b/d/(c^2*d+e)*sum(_R1/(_R1^2*e-2*c^2*
d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x
-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+3/8*c^
2*a/d^2*x/(c^2*e*x^2+c^2*d)+1/4*c^4*a*x/d/(c^2*e*x^2+c^2*d)^2+1/8*c^5*b/(c^
2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)+3/16*c^3*b/d/(c^2*d+e)*sum(1/
_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R
1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2
*e)*_Z^2+e))-7/4*c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arc
tan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)-e)*e)
^(1/2))/(c^2*d+e)^2/e^2-7/4*c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^(1/2)+e)*e)
^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(c^2*d+e))^(
1/2)+e)*e)^(1/2))/(c^2*d+e)^2/e^2+c^5*b*(-(2*c^2*d-2*(c^2*d*(c^2*d+e))^(1/2
)+e)*e)^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(c^2*d*(c^2*
d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)+c^5*b*((2*c^2*d+2*(c^2*d*(c^2*d+e))^
(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(c^2*d*(
c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)+5/8*c^6*b/(c^2*d+e)/(c^2*e*x^2+c
^2*d)^2*arcsin(c*x)*x+3/16*c*b/d^2/(c^2*d+e)*e*sum(_R1/(_R1^2*e-2*c^2*d-e)*
(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^
2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+3/16*c*b/d^
2/(c^2*d+e)*e*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b \arcsin\left(cx\right) + a}{e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{(ex^2 + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^3, x)
```

3.649 $\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right),x\right)$$

```
[Out] Unintegrable[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]), x]
```

Rubi [A] time = 0.0217492, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] Defer[Int][Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)\,dx = \int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)\,dx$$

Mathematica [A] time = 5.89892, size = 0, normalized size = 0.

$$\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]), x]
```

Maple [A] time = 0.514, size = 0, normalized size = 0.

$$\int \sqrt{ex^2+d}\,(a+b\arcsin(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{ex^2+d}(b\arcsin(cx)+a),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int(a+b\,\text{asin}(cx))\sqrt{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral((a + b*asin(c*x))*sqrt(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{ex^2+d}(b\arcsin(cx)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a), x)
```

3.650 $\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}},x\right)$$

```
[Out] Unintegrable[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2], x]
```

Rubi [A] time = 0.0225675, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2],x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}}\,dx=\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$$

Mathematica [A] time = 4.09084, size = 0, normalized size = 0.

$$\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2],x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2], x]
```

Maple [A] time = 0.421, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b \arcsin\left(cx\right) + a}{\sqrt{ex^2 + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/sqrt(e*x^2 + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b \operatorname{asin}\left(cx\right)}{\sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/sqrt(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin\left(cx\right) + a}{\sqrt{ex^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/sqrt(e*x^2 + d), x)
```

3.651 $\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=70

$$\frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d + e*x^2]) + (b*ArcTan[(Sqrt[e]*Sqrt[1 - c
^2*x^2])/(c*Sqrt[d + e*x^2])])/(d*Sqrt[e])
```

Rubi [A] time = 0.0985282, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {191, 4665, 12, 444, 63, 217, 203}

$$\frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d + e*x^2]) + (b*ArcTan[(Sqrt[e]*Sqrt[1 - c
^2*x^2])/(c*Sqrt[d + e*x^2])])/(d*Sqrt[e])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4665

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
```

```
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx &= \frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}-(bc)\int \frac{x}{d\sqrt{1-c^2x^2}\sqrt{d+ex^2}}\,dx\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}-\frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{d+ex^2}}\,dx}{d}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}-\frac{(bc)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-c^2x}\sqrt{d+ex}}\,dx,x,x^2\right)}{2d}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\,\text{Subst}\left(\int \frac{1}{\sqrt{d+\frac{e}{c^2}-\frac{ex^2}{c^2}}}\,dx,x,\sqrt{1-c^2x^2}\right)}{cd}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\,\text{Subst}\left(\int \frac{1}{1+\frac{ex^2}{c^2}}\,dx,x,\frac{\sqrt{1-c^2x^2}}{\sqrt{d+ex^2}}\right)}{cd}\\
&= \frac{x\left(a+b\sin^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}
\end{aligned}$$

Mathematica [C] time = 0.116946, size = 74, normalized size = 1.06

$$\frac{x\left(2\left(a+b\sin^{-1}(cx)\right)-bcx\sqrt{\frac{ex^2}{d}+1}F_1\left(1;\frac{1}{2},\frac{1}{2};2;c^2x^2,-\frac{ex^2}{d}\right)\right)}{2d\sqrt{d+ex^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(3/2),x]
```

```
[Out] (x*(-(b*c*x*Sqrt[1 + (e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2)
/d)]) + 2*(a + b*ArcSin[c*x])))/(2*d*Sqrt[d + e*x^2])
```

Maple [F] time = 0.313, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 2.30991, size = 651, normalized size = 9.3

$$\left[-\frac{\left(bex^2+bd\right)\sqrt{-e}\log\left(8\,c^4e^2x^4+c^4d^2-6\,c^2de+8\left(c^4de-c^2e^2\right)x^2+4\left(2\,c^3ex^2+c^3d-ce\right)\sqrt{-c^2x^2+1}\sqrt{ex^2+d}\sqrt{-e}+e^2\right.}{4\left(de^2x^2+d^2e\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [-1/4*((b*e*x^2 + b*d)*sqrt(-e)*log(8*c^4*e^2*x^4 + c^4*d^2 - 6*c^2*d*e + 8
*(c^4*d*e - c^2*e^2)*x^2 + 4*(2*c^3*e*x^2 + c^3*d - c*e)*sqrt(-c^2*x^2 + 1)
*sqrt(e*x^2 + d)*sqrt(-e) + e^2) - 4*(b*e*x*arcsin(c*x) + a*e*x)*sqrt(e*x^2
 + d))/(d*e^2*x^2 + d^2*e), 1/2*((b*e*x^2 + b*d)*sqrt(e)*arctan(1/2*(2*c^2*
e*x^2 + c^2*d - e)*sqrt(-c^2*x^2 + 1)*sqrt(e*x^2 + d)*sqrt(e)/(c^3*e^2*x^4
- c*d*e + (c^3*d*e - c*e^2)*x^2)) + 2*(b*e*x*arcsin(c*x) + a*e*x)*sqrt(e*x^
2 + d))/(d*e^2*x^2 + d^2*e)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\operatorname{asin}(cx)}{\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\arcsin(cx)+a}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(3/2), x)
```

3.652 $\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=146

$$\frac{2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}+\frac{bc\sqrt{1-c^2x^2}}{3d\left(c^2d+e\right)\sqrt{d+ex^2}}$$

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(3*d*(c^2*d + e)*Sqrt[d + e*x^2]) + (x*(a + b*ArcSi
n[c*x]))/(3*d*(d + e*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d
+ e*x^2]) + (2*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(
3*d^2*Sqrt[e])
```

Rubi [A] time = 0.16007, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.45, Rules used = {192, 191, 4665, 12, 571, 78, 63, 217, 203}

$$\frac{2x\left(a+b\sin^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}+\frac{bc\sqrt{1-c^2x^2}}{3d\left(c^2d+e\right)\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(3*d*(c^2*d + e)*Sqrt[d + e*x^2]) + (x*(a + b*ArcSi
n[c*x]))/(3*d*(d + e*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d
+ e*x^2]) + (2*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(
3*d^2*Sqrt[e])
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4665

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 571

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx = \frac{x(a+b\sin^{-1}(cx))}{3d(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - (bc)\int \frac{x(3d+2ex^2)}{3d^2\sqrt{1-c^2x^2}(d+ex^2)^{3/2}}\,dx$$

$$= \frac{x(a+b\sin^{-1}(cx))}{3d(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - \frac{(bc)\int \frac{x(3d+2ex^2)}{\sqrt{1-c^2x^2}(d+ex^2)^{3/2}}\,dx}{3d^2}$$

$$= \frac{x(a+b\sin^{-1}(cx))}{3d(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - \frac{(bc)\,\text{Subst}\left(\int \frac{3d+2ex}{\sqrt{1-c^2x}(d+ex)^{3/2}}\,dx, x, x^2\right)}{6d^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - \frac{(bc)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-c^2x}\sqrt{d+ex}}\,a\right.}{3d^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} + \frac{(2b)\,\text{Subst}\left(\int \frac{1}{\sqrt{d+\frac{e}{c^2}-\frac{ex^2}{c^2}}}\,d\right.}{3cd^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} + \frac{(2b)\,\text{Subst}\left(\int \frac{1}{1+\frac{ex^2}{c^2}}\,dx, x, \right.}{3cd^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} + \frac{2b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}$$

Mathematica [C] time = 0.240106, size = 190, normalized size = 1.3

$$\sqrt{d+ex^2}\left(\frac{2ax}{3d^2(d+ex^2)} + \frac{ax}{3d(d+ex^2)^2}\right) - \frac{bcx^2\sqrt{\frac{d+ex^2}{d}}F_1\left(1;\frac{1}{2},\frac{1}{2};2;c^2x^2,-\frac{ex^2}{d}\right)}{3d^2\sqrt{d+ex^2}} + \frac{bc\sqrt{1-c^2x^2}}{3d(c^2d+e)\sqrt{d+ex^2}} + \frac{bx\sin^{-1}(cx)}{3d^2(d+}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(3*d*(c^2*d + e)*Sqrt[d + e*x^2]) + Sqrt[d + e*x^2]
*((a*x)/(3*d*(d + e*x^2)^2) + (2*a*x)/(3*d^2*(d + e*x^2))) - (b*c*x^2*Sqrt[
(d + e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2)/d)])/(3*d^2*Sqrt
[d + e*x^2]) + (b*x*(3*d + 2*e*x^2)*ArcSin[c*x])/(3*d^2*(d + e*x^2)^(3/2))
```

Maple [F] time = 0.323, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(ex^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}a\left(\frac{2x}{\sqrt{ex^2+d}d^2}+\frac{x}{\left(ex^2+d\right)^{\frac{3}{2}}d}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{\left(e^2x^4+2dex^2+d^2\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(2*x/(sqrt(e*x^2 + d)*d^2) + x/((e*x^2 + d)^(3/2)*d)) + b*integrate(a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt
(e*x^2 + d)), x)
```

Fricas [B] time = 2.70761, size = 1418, normalized size = 9.71

$$\left[-\frac{\left(bc^2d^3+\left(bc^2de^2+be^3\right)x^4+bd^2e+2\left(bc^2d^2e+bde^2\right)x^2\right)\sqrt{-e}\log\left(8c^4e^2x^4+c^4d^2-6c^2de+8\left(c^4de-c^2e^2\right)x^2+4\left(2\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/6*((b*c^2*d^3 + (b*c^2*d*e^2 + b*e^3)*x^4 + b*d^2*e + 2*(b*c^2*d^2*e +
b*d*e^2)*x^2)*sqrt(-e)*log(8*c^4*e^2*x^4 + c^4*d^2 - 6*c^2*d*e + 8*(c^4*d*e
 - c^2*e^2)*x^2 + 4*(2*c^3*e*x^2 + c^3*d - c*e)*sqrt(-c^2*x^2 + 1)*sqrt(e*x
^2 + d)*sqrt(-e) + e^2) - 2*(2*(a*c^2*d*e^2 + a*e^3)*x^3 + 3*(a*c^2*d^2*e +
 a*d*e^2)*x + (2*(b*c^2*d*e^2 + b*e^3)*x^3 + 3*(b*c^2*d^2*e + b*d*e^2)*x)*a
rcsin(c*x) + (b*c*d*e^2*x^2 + b*c*d^2*e)*sqrt(-c^2*x^2 + 1))*sqrt(e*x^2 + d
))/(c^2*d^5*e + d^4*e^2 + (c^2*d^3*e^3 + d^2*e^4)*x^4 + 2*(c^2*d^4*e^2 + d^
3*e^3)*x^2), 1/3*((b*c^2*d^3 + (b*c^2*d*e^2 + b*e^3)*x^4 + b*d^2*e + 2*(b*c
^2*d^2*e + b*d*e^2)*x^2)*sqrt(e)*arctan(1/2*(2*c^2*e*x^2 + c^2*d - e)*sqrt(
-c^2*x^2 + 1)*sqrt(e*x^2 + d)*sqrt(e)/(c^3*e^2*x^4 - c*d*e + (c^3*d*e - c*e
^2)*x^2)) + (2*(a*c^2*d*e^2 + a*e^3)*x^3 + 3*(a*c^2*d^2*e + a*d*e^2)*x + (2
*(b*c^2*d*e^2 + b*e^3)*x^3 + 3*(b*c^2*d^2*e + b*d*e^2)*x)*arcsin(c*x) + (b*
c*d*e^2*x^2 + b*c*d^2*e)*sqrt(-c^2*x^2 + 1))*sqrt(e*x^2 + d))/(c^2*d^5*e +
d^4*e^2 + (c^2*d^3*e^3 + d^2*e^4)*x^4 + 2*(c^2*d^4*e^2 + d^3*e^3)*x^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{\left(ex^2 + d\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(5/2), x)
```

3.653 $\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^{7/2}}\,dx$

Optimal. Leaf size=226

$$\frac{8x\left(a+b\sin^{-1}(cx)\right)}{15d^3\sqrt{d+ex^2}}+\frac{4x\left(a+b\sin^{-1}(cx)\right)}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}}+\frac{2bc\sqrt{1-c^2x^2}\left(3c^2d+2e\right)}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}}+\frac{8b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{15d^3\sqrt{e}}$$

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(15*d*(c^2*d + e)*(d + e*x^2)^(3/2)) + (2*b*c*(3*c^
2*d + 2*e)*Sqrt[1 - c^2*x^2])/(15*d^2*(c^2*d + e)^2*Sqrt[d + e*x^2]) + (x*(
a + b*ArcSin[c*x]))/(5*d*(d + e*x^2)^(5/2)) + (4*x*(a + b*ArcSin[c*x]))/(15
*d^2*(d + e*x^2)^(3/2)) + (8*x*(a + b*ArcSin[c*x]))/(15*d^3*Sqrt[d + e*x^2]
) + (8*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(15*d^3*S
qrt[e])
```

Rubi [A] time = 0.824567, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {192, 191, 4665, 12, 6715, 949, 78, 63, 217, 203}

$$\frac{8x\left(a+b\sin^{-1}(cx)\right)}{15d^3\sqrt{d+ex^2}}+\frac{4x\left(a+b\sin^{-1}(cx)\right)}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}}+\frac{2bc\sqrt{1-c^2x^2}\left(3c^2d+2e\right)}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}}+\frac{8b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{15d^3\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(7/2),x]
```


```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(15*d*(c^2*d + e)*(d + e*x^2)^(3/2)) + (2*b*c*(3*c^
2*d + 2*e)*Sqrt[1 - c^2*x^2])/(15*d^2*(c^2*d + e)^2*Sqrt[d + e*x^2]) + (x*(
a + b*ArcSin[c*x]))/(5*d*(d + e*x^2)^(5/2)) + (4*x*(a + b*ArcSin[c*x]))/(15
*d^2*(d + e*x^2)^(3/2)) + (8*x*(a + b*ArcSin[c*x]))/(15*d^3*Sqrt[d + e*x^2]
) + (8*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(15*d^3*S
qrt[e])
```


Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4665

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rule 949

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x
 + c*x^2)^p, d + e*x, x], R = PolynomialRemainder[(a + b*x + c*x^2)^p, d +
e*x, x]}, Simp[(R*(d + e*x)^(m + 1)*(f + g*x)^(n + 1))/((m + 1)*(e*f - d*g)
), x] + Dist[1/((m + 1)*(e*f - d*g)), Int[(d + e*x)^(m + 1)*(f + g*x)^n*Exp
andToSum[(m + 1)*(e*f - d*g)*Qx - g*R*(m + n + 2), x], x], x]] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c
*d^2 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^{7/2}}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}(cx)\right)}{15d^2\left(d+ex^2\right)^{3/2}} + \frac{8x\left(a+b\sin^{-1}(cx)\right)}{15d^3\sqrt{d+ex^2}} - (bc)\int \frac{x\left(15d^2+20dex^2\right.}{15d^3\sqrt{1-c^2x^2}\left(d\right.}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}(cx)\right)}{15d^2\left(d+ex^2\right)^{3/2}} + \frac{8x\left(a+b\sin^{-1}(cx)\right)}{15d^3\sqrt{d+ex^2}} - \frac{(bc)\int \frac{x\left(15d^2+20dex^2+8e^2x^4\right)}{\sqrt{1-c^2x^2}\left(d+ex^2\right)^{5/2}}}{15d^3}$$

$$= \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}(cx)\right)}{15d^2\left(d+ex^2\right)^{3/2}} + \frac{8x\left(a+b\sin^{-1}(cx)\right)}{15d^3\sqrt{d+ex^2}} - \frac{(bc)\,\text{Subst}\left(\int \frac{15d^2+20dex+8}{\sqrt{1-c^2x}(d+ex}\right.}{30d^3}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}(cx)\right)}{15d^2\left(d+ex^2\right)^{3/2}} + \frac{8x\left(a+b\sin^{-1}(cx)\right)}{15d^3\sqrt{d+ex^2}}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}} + \frac{2bc\left(3c^2d+2e\right)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}\right.}{15d^2\left(d+ex\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}} + \frac{2bc\left(3c^2d+2e\right)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}\right.}{15d^2\left(d+ex\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}} + \frac{2bc\left(3c^2d+2e\right)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}\right.}{15d^2\left(d+ex\right.}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}} + \frac{2bc\left(3c^2d+2e\right)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)}{5d\left(d+ex^2\right)^{5/2}} + \frac{4x\left(a+b\sin^{-1}\right.}{15d^2\left(d+ex\right.}$$

Mathematica [C] time = 0.433486, size = 188, normalized size = 0.83

$$\frac{ax\left(15d^2+20dex^2+8e^2x^4\right)-4bcx^2\sqrt{\frac{ex^2}{d}+1}\left(d+ex^2\right)^2F_1\left(1;\frac{1}{2},\frac{1}{2};2;c^2x^2,-\frac{ex^2}{d}\right)+\frac{bcd\sqrt{1-c^2x^2}\left(d+ex^2\right)\left(c^2d\left(7d+6ex^2\right)+e\left(5d+4ex\right.\right.}{\left(c^2d+e\right)^2}}{15d^3\left(d+ex^2\right)^{5/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(7/2),x]
```

```
[Out] (a*x*(15*d^2 + 20*d*e*x^2 + 8*e^2*x^4) + (b*c*d*Sqrt[1 - c^2*x^2]*(d + e*x^
2)*(e*(5*d + 4*e*x^2) + c^2*d*(7*d + 6*e*x^2)))/(c^2*d + e)^2 - 4*b*c*x^2*(
d + e*x^2)^2*Sqrt[1 + (e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2
)/d)] + b*x*(15*d^2 + 20*d*e*x^2 + 8*e^2*x^4)*ArcSin[c*x])/(15*d^3*(d + e*x
^2)^(5/2))
```

Maple [F] time = 0.325, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))\left(ex^2+d\right)^{-\frac{7}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{15}a\left(\frac{8x}{\sqrt{ex^2+d}d^3}+\frac{4x}{\left(ex^2+d\right)^{\frac{3}{2}}d^2}+\frac{3x}{\left(ex^2+d\right)^{\frac{5}{2}}d}\right)+b\int\frac{\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)}{\left(e^3x^6+3de^2x^4+3d^2ex^2+d^3\right)\sqrt{ex^2+d}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="maxima")
```

```
[Out] 1/15*a*(8*x/(sqrt(e*x^2 + d)*d^3) + 4*x/((e*x^2 + d)^(3/2)*d^2) + 3*x/((e*x
^2 + d)^(5/2)*d)) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/
((e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3)*sqrt(e*x^2 + d)), x)
```

Fricas [B] time = 3.49197, size = 2700, normalized size = 11.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="fricas")
```

```
[Out] [-1/15*(2*(b*c^4*d^5 + 2*b*c^2*d^4*e + (b*c^4*d^2*e^3 + 2*b*c^2*d*e^4 + b*e
^5)*x^6 + b*d^3*e^2 + 3*(b*c^4*d^3*e^2 + 2*b*c^2*d^2*e^3 + b*d*e^4)*x^4 + 3
*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x^2)*sqrt(-e)*log(8*c^4*e^2*x^
4 + c^4*d^2 - 6*c^2*d*e + 8*(c^4*d*e - c^2*e^2)*x^2 + 4*(2*c^3*e*x^2 + c^3*
d - c*e)*sqrt(-c^2*x^2 + 1)*sqrt(e*x^2 + d)*sqrt(-e) + e^2) - (8*(a*c^4*d^2
*e^3 + 2*a*c^2*d*e^4 + a*e^5)*x^5 + 20*(a*c^4*d^3*e^2 + 2*a*c^2*d^2*e^3 + a
*d*e^4)*x^3 + 15*(a*c^4*d^4*e + 2*a*c^2*d^3*e^2 + a*d^2*e^3)*x + (8*(b*c^4*
d^2*e^3 + 2*b*c^2*d*e^4 + b*e^5)*x^5 + 20*(b*c^4*d^3*e^2 + 2*b*c^2*d^2*e^3
+ b*d*e^4)*x^3 + 15*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x)*arcsin(c
*x) + (7*b*c^3*d^4*e + 5*b*c*d^3*e^2 + 2*(3*b*c^3*d^2*e^3 + 2*b*c*d*e^4)*x^
4 + (13*b*c^3*d^3*e^2 + 9*b*c*d^2*e^3)*x^2)*sqrt(-c^2*x^2 + 1))*sqrt(e*x^2
+ d))/(c^4*d^8*e + 2*c^2*d^7*e^2 + d^6*e^3 + (c^4*d^5*e^4 + 2*c^2*d^4*e^5 +
 d^3*e^6)*x^6 + 3*(c^4*d^6*e^3 + 2*c^2*d^5*e^4 + d^4*e^5)*x^4 + 3*(c^4*d^7*
e^2 + 2*c^2*d^6*e^3 + d^5*e^4)*x^2), 1/15*(4*(b*c^4*d^5 + 2*b*c^2*d^4*e + (
b*c^4*d^2*e^3 + 2*b*c^2*d*e^4 + b*e^5)*x^6 + b*d^3*e^2 + 3*(b*c^4*d^3*e^2 +
 2*b*c^2*d^2*e^3 + b*d*e^4)*x^4 + 3*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*
e^3)*x^2)*sqrt(e)*arctan(1/2*(2*c^2*e*x^2 + c^2*d - e)*sqrt(-c^2*x^2 + 1)*s
qrt(e*x^2 + d)*sqrt(e)/(c^3*e^2*x^4 - c*d*e + (c^3*d*e - c*e^2)*x^2)) + (8*
(a*c^4*d^2*e^3 + 2*a*c^2*d*e^4 + a*e^5)*x^5 + 20*(a*c^4*d^3*e^2 + 2*a*c^2*d
^2*e^3 + a*d*e^4)*x^3 + 15*(a*c^4*d^4*e + 2*a*c^2*d^3*e^2 + a*d^2*e^3)*x +
(8*(b*c^4*d^2*e^3 + 2*b*c^2*d*e^4 + b*e^5)*x^5 + 20*(b*c^4*d^3*e^2 + 2*b*c^
2*d^2*e^3 + b*d*e^4)*x^3 + 15*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x
)*arcsin(c*x) + (7*b*c^3*d^4*e + 5*b*c*d^3*e^2 + 2*(3*b*c^3*d^2*e^3 + 2*b*c
*d*e^4)*x^4 + (13*b*c^3*d^3*e^2 + 9*b*c*d^2*e^3)*x^2)*sqrt(-c^2*x^2 + 1))*s
qrt(e*x^2 + d))/(c^4*d^8*e + 2*c^2*d^7*e^2 + d^6*e^3 + (c^4*d^5*e^4 + 2*c^2
*d^4*e^5 + d^3*e^6)*x^6 + 3*(c^4*d^6*e^3 + 2*c^2*d^5*e^4 + d^4*e^5)*x^4 + 3
*(c^4*d^7*e^2 + 2*c^2*d^6*e^3 + d^5*e^4)*x^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(7/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \arcsin(cx) + a}{(ex^2 + d)^{\frac{7}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(7/2), x)
```

3.654 $\int (fx)^m \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=484

$$-\frac{b(fx)^{m+2}\left(\frac{e(m+2)\left(3c^4d^2\left(m^2+12m+35\right)^2+3c^2de(m+7)^2\left(m^2+7m+12\right)+e^2\left(m^4+18m^3+119m^2+342m+360\right)\right)}{(m+3)(m+5)(m+7)}+\frac{c^6d^3(m+3)(m+5)(m+7)}{m+1}\right)\text{Hypergeome}}{c^5f^2(m+2)(m+3)(m+5)(m+7)}$$

```
[Out] (b*e*(3*c^2*d*e*(7 + m)^2*(12 + 7*m + m^2) + 3*c^4*d^2*(35 + 12*m + m^2)^2
+ e^2*(360 + 342*m + 119*m^2 + 18*m^3 + m^4))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^5*f^2*(3 + m)^2*(5 + m)^2*(7 + m)^2) + (b*e^2*(3*c^2*d*(7 + m)^2 + e
*(30 + 11*m + m^2))*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])/(c^3*f^4*(5 + m)^2*(7
+ m)^2) + (b*e^3*(f*x)^(6 + m)*Sqrt[1 - c^2*x^2])/(c*f^6*(7 + m)^2) + (d^3*
(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) + (3*d^2*e*(f*x)^(3 + m)*(a
+ b*ArcSin[c*x]))/(f^3*(3 + m)) + (3*d*e^2*(f*x)^(5 + m)*(a + b*ArcSin[c*x]
))/(f^5*(5 + m)) + (e^3*(f*x)^(7 + m)*(a + b*ArcSin[c*x]))/(f^7*(7 + m)) -
(b*((c^6*d^3*(3 + m)*(5 + m)*(7 + m))/(1 + m) + (e*(2 + m)*(3*c^2*d*e*(7 +
m)^2*(12 + 7*m + m^2) + 3*c^4*d^2*(35 + 12*m + m^2)^2 + e^2*(360 + 342*m +
119*m^2 + 18*m^3 + m^4)))/((3 + m)*(5 + m)*(7 + m)))*(f*x)^(2 + m)*Hypergeo
metric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(c^5*f^2*(2 + m)*(3 + m)*(5
+ m)*(7 + m))
```

Rubi [A] time = 2.37629, antiderivative size = 455, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {270, 4731, 12, 1809, 1267, 459, 364}

$$\frac{3d^2e(fx)^{m+3}\left(a+b\sin^{-1}(cx)\right)}{f^3(m+3)}+\frac{d^3(fx)^{m+1}\left(a+b\sin^{-1}(cx)\right)}{f(m+1)}+\frac{3de^2(fx)^{m+5}\left(a+b\sin^{-1}(cx)\right)}{f^5(m+5)}+\frac{e^3(fx)^{m+7}\left(a+b\sin^{-1}(c\right.}{f^7(m+7)}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(3*c^2*d*e*(7 + m)^2*(12 + 7*m + m^2) + 3*c^4*d^2*(35 + 12*m + m^2)^2
+ e^2*(360 + 342*m + 119*m^2 + 18*m^3 + m^4))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^5*f^2*(3 + m)^2*(5 + m)^2*(7 + m)^2) + (b*e^2*(3*c^2*d*(7 + m)^2 + e
*(30 + 11*m + m^2))*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])/(c^3*f^4*(5 + m)^2*(7
+ m)^2) + (b*e^3*(f*x)^(6 + m)*Sqrt[1 - c^2*x^2])/(c*f^6*(7 + m)^2) + (d^3*
(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) + (3*d^2*e*(f*x)^(3 + m)*(a
+ b*ArcSin[c*x]))/(f^3*(3 + m)) + (3*d*e^2*(f*x)^(5 + m)*(a + b*ArcSin[c*x]
))/(f^5*(5 + m)) + (e^3*(f*x)^(7 + m)*(a + b*ArcSin[c*x]))/(f^7*(7 + m)) -
(b*c*(d^3/(2 + 3*m + m^2) + (e*(3*c^2*d*e*(7 + m)^2*(12 + 7*m + m^2) + 3*c^
4*d^2*(35 + 12*m + m^2)^2 + e^2*(360 + 342*m + 119*m^2 + 18*m^3 + m^4)))/(c
^6*(3 + m)^2*(5 + m)^2*(7 + m)^2))*(f*x)^(2 + m)*Hypergeometric2F1[1/2, (2
+ m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1809

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[(f*(c*x)^(m + q -
1)*(a + b*x^2)^(p + 1))/(b*c^(q - 1)*(m + q + 2*p + 1)), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 1267

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[(c^p*(f*x)^(m + 4*p - 1)*(d + e*x^2)^
(q + 1))/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1)), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx = \frac{d^3(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{3d^2e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} + \frac{3de^2(fx)^{5+m}\left(a\right.}{f^5(5}$$

$$= \frac{d^3(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{3d^2e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} + \frac{3de^2(fx)^{5+m}\left(a\right.}{f^5(5}$$

$$= \frac{be^3(fx)^{6+m}\sqrt{1-c^2x^2}}{cf^6(7+m)^2} + \frac{d^3(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{3d^2e(fx)^{3+m}\left(a+b\sin\right.}{f^3(3+m)}$$

$$= \frac{be^2\left(3c^2d(7+m)^2+e\left(30+11m+m^2\right)\right)(fx)^{4+m}\sqrt{1-c^2x^2}}{c^3f^4(5+m)^2(7+m)^2} + \frac{be^3(fx)^{6+m}\sqrt{1-}}{cf^6(7+m)^2}$$

$$= \frac{be\left(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2\left(35+12m+m^2\right)^2+e^2\left(360+342\right.\right.}{c^5f^2(3+m)^2(5+m)^2(7+m)^2}$$

$$= \frac{be\left(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2\left(35+12m+m^2\right)^2+e^2\left(360+342\right.\right.}{c^5f^2(3+m)^2(5+m)^2(7+m)^2}$$

Mathematica [F] time = 5.31832, size = 0, normalized size = 0.

$$\int (fx)^m \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right) dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] Integrate[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]), x]
```

Maple [F] time = 22.783, size = 0, normalized size = 0.

$$\int (fx)^m \left(ex^2+d\right)^3 (a+b\arcsin(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] int((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ae^3x^6 + 3\,ade^2x^4 + 3\,ad^2ex^2 + ad^3 + \left(be^3x^6 + 3\,bde^2x^4 + 3\,bd^2ex^2 + bd^3\right)\arcsin\left(cx\right)\right)\left(fx\right)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2 + d\right)^3 \left(b \arcsin\left(cx\right) + a\right)\left(fx\right)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

3.655 $\int (fx)^m \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx$

Optimal. Leaf size=293

$$-\frac{b(fx)^{m+2}\left(\frac{c^4d^2(m+3)(m+5)}{m+1}+\frac{e(m+2)\left(2c^2d(m+5)^2+e\left(m^2+7m+12\right)\right)}{(m+3)(m+5)}\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{c^3f^2(m+2)(m+3)(m+5)}+\frac{d^2(fx)^{m+1}\left(a+b\right.}{f(m+1}$$

```
[Out] (b*e*(2*c^2*d*(5 + m)^2 + e*(12 + 7*m + m^2))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^3*f^2*(3 + m)^2*(5 + m)^2) + (b*e^2*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])
/(c*f^4*(5 + m)^2) + (d^2*(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) +
(2*d*e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f^3*(3 + m)) + (e^2*(f*x)^(5 + m
)*(a + b*ArcSin[c*x]))/(f^5*(5 + m)) - (b*((c^4*d^2*(3 + m)*(5 + m))/(1 + m
) + (e*(2 + m)*(2*c^2*d*(5 + m)^2 + e*(12 + 7*m + m^2)))/((3 + m)*(5 + m)))
*(f*x)^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(c^3*
f^2*(2 + m)*(3 + m)*(5 + m))
```

Rubi [A] time = 0.415264, antiderivative size = 272, normalized size of antiderivative = 0.93, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {270, 4731, 12, 1267, 459, 364}

$$\frac{d^2(fx)^{m+1}\left(a+b\sin^{-1}(cx)\right)}{f(m+1)}+\frac{2de(fx)^{m+3}\left(a+b\sin^{-1}(cx)\right)}{f^3(m+3)}+\frac{e^2(fx)^{m+5}\left(a+b\sin^{-1}(cx)\right)}{f^5(m+5)}-\frac{bc(fx)^{m+2}\left(\frac{e\left(2c^2d(m+5)^2+e\left(m^2\right.\right.}{c^4(m+3)^2(m+}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(2*c^2*d*(5 + m)^2 + e*(12 + 7*m + m^2))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^3*f^2*(3 + m)^2*(5 + m)^2) + (b*e^2*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])
/(c*f^4*(5 + m)^2) + (d^2*(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) +
(2*d*e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f^3*(3 + m)) + (e^2*(f*x)^(5 + m
)*(a + b*ArcSin[c*x]))/(f^5*(5 + m)) - (b*c*(d^2/(2 + 3*m + m^2) + (e*(2*c^
2*d*(5 + m)^2 + e*(12 + 7*m + m^2)))/(c^4*(3 + m)^2*(5 + m)^2))*(f*x)^(2 +
m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1267

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[(c^p*(f*x)^(m + 4*p - 1)*(d + e*x^2)^
(q + 1))/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1)), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right) dx = \frac{d^2(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} + \frac{e^2(fx)^{5+m}\left(a\right.}{f^5(5}$$

$$= \frac{d^2(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} + \frac{e^2(fx)^{5+m}\left(a\right.}{f^5(5}$$

$$= \frac{be^2(fx)^{4+m}\sqrt{1-c^2x^2}}{cf^4(5+m)^2} + \frac{d^2(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\,\mathrm{si}\right.}{f^3(3+m)}$$

$$= \frac{be\left(2c^2d(5+m)^2+e\left(12+7m+m^2\right)\right)(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2} + \frac{be^2(fx)^{4+m}\sqrt{1-}}{cf^4(5+m)}$$

$$= \frac{be\left(2c^2d(5+m)^2+e\left(12+7m+m^2\right)\right)(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2} + \frac{be^2(fx)^{4+m}\sqrt{1-}}{cf^4(5+m)}$$

Mathematica [A] time = 0.279903, size = 224, normalized size = 0.76

$$x(fx)^m\left(-\frac{bcd^2x\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2}+1,\frac{m}{2}+2,c^2x^2\right)}{m^2+3m+2} - \frac{2bcdex^3\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2}+2,\frac{m}{2}+3,c^2x^2\right.}{m^2+7m+12}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] x*(f*x)^m*((a*d^2)/(1 + m) + (2*a*d*e*x^2)/(3 + m) + (a*e^2*x^4)/(5 + m) +
(b*d^2*ArcSin[c*x])/(1 + m) + (2*b*d*e*x^2*ArcSin[c*x])/(3 + m) + (b*e^2*x^
```

```
4*ArcSin[c*x])/(5 + m) - (b*c*d^2*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2
, c^2*x^2])/(2 + 3*m + m^2) - (2*b*c*d*e*x^3*Hypergeometric2F1[1/2, 2 + m/2
, 3 + m/2, c^2*x^2])/(12 + 7*m + m^2) - (b*c*e^2*x^5*Hypergeometric2F1[1/2,
 3 + m/2, 4 + m/2, c^2*x^2])/((5 + m)*(6 + m)))
```

Maple [F] time = 8.931, size = 0, normalized size = 0.

$$\int (fx)^m (ex^2+d)^2 (a+b \arcsin (cx)) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] int((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arcsin (cx)\right)(fx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2 + d\right)^2 (b \arcsin(cx) + a) \left(fx\right)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

3.656 $\int (fx)^m \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx$

Optimal. Leaf size=161

$$-\frac{b(fx)^{m+2}\left(c^2d(m+3)^2+e(m+1)(m+2)\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{cf^2(m+1)(m+2)(m+3)^2}+\frac{d(fx)^{m+1}\left(a+b\sin^{-1}(cx)\right)}{f(m+1)}+\frac{e\cdots}{}$$

```
[Out] (b*e*(f*x)^(2 + m)*Sqrt[1 - c^2*x^2])/(c*f^2*(3 + m)^2) + (d*(f*x)^(1 + m)*
(a + b*ArcSin[c*x]))/(f*(1 + m)) + (e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f
^3*(3 + m)) - (b*(e*(1 + m)*(2 + m) + c^2*d*(3 + m)^2)*(f*x)^(2 + m)*Hyperg
eometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(c*f^2*(1 + m)*(2 + m)*(3
+ m)^2)
```

Rubi [A] time = 0.166187, antiderivative size = 148, normalized size of antiderivative = 0.92, number of steps used = 4, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {14, 4731, 12, 459, 364}

$$\frac{d(fx)^{m+1}\left(a+b\sin^{-1}(cx)\right)}{f(m+1)}+\frac{e(fx)^{m+3}\left(a+b\sin^{-1}(cx)\right)}{f^3(m+3)}-\frac{bc(fx)^{m+2}\left(\frac{e}{c^2(m+3)^2}+\frac{d}{m^2+3m+2}\right)\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{f^2}+\frac{be\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(f*x)^(2 + m)*Sqrt[1 - c^2*x^2])/(c*f^2*(3 + m)^2) + (d*(f*x)^(1 + m)*
(a + b*ArcSin[c*x]))/(f*(1 + m)) + (e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f
^3*(3 + m)) - (b*c*(e/(c^2*(3 + m)^2) + d/(2 + 3*m + m^2))*(f*x)^(2 + m)*Hy
pergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right) dx = \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} - (bc)\int \frac{(fx)^{1+m}\left(\right.}{f(1+}$$

$$= \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} - \frac{(bc)\int \frac{(fx)^{1+m}(d(3+}{\sqrt{1-}}}{f\left(3+4m\right.}$$

$$= \frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2} + \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}\left(a+b\sin^{-1}(c\right.}{f^3(3+m)}$$

$$= \frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2} + \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}\left(a+b\sin^{-1}(c\right.}{f^3(3+m)}$$

Mathematica [A] time = 0.180262, size = 122, normalized size = 0.76

$$x(fx)^m\left(\frac{\frac{\left(d(m+3)+e(m+1)x^2\right)\left(a+b\sin^{-1}(cx)\right)}{m+1} - \frac{bcex^3\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2}+2,\frac{m}{2}+3,c^2x^2\right)}{m+4}}{m+3} - \frac{bcdx\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m}{2}+1,\right.}{m^2+3m+2}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] x*(f*x)^m*(-((b*c*d*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2
 + 3*m + m^2)) + (((d*(3 + m) + e*(1 + m)*x^2)*(a + b*ArcSin[c*x]))/(1 + m)
 - (b*c*e*x^3*Hypergeometric2F1[1/2, 2 + m/2, 3 + m/2, c^2*x^2])/(4 + m))/(
3 + m))
```

Maple [F] time = 3.367, size = 0, normalized size = 0.

$$\int (fx)^m \left(ex^2+d\right)(a+b\arcsin(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(aex^2 + ad + \left(bex^2 + bd\right)\arcsin\left(cx\right)\right)\left(fx\right)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx\right)^m \left(a + b\,\text{asin}\left(cx\right)\right)\left(d + ex^2\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Integral((f*x)**m*(a + b*asin(c*x))*(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2 + d\right)\left(b\arcsin\left(cx\right) + a\right)\left(fx\right)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

3.657 $\int \frac{(fx)^m(a+b\sin^{-1}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{d+ex^2},x\right)$$

[Out] Unintegrable[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2), x]

Rubi [A] time = 0.0622664, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2),x]

[Out] Defer[Int][((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2), x]

Rubi steps

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx=\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx$$

Mathematica [A] time = 8.54493, size = 0, normalized size = 0.

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2),x]

[Out] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2), x]

Maple [A] time = 0.883, size = 0, normalized size = 0.

$$\int \frac{(fx)^m\,(a+b\arcsin(cx))}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)

[Out] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)(fx)^m}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{(b\arcsin(cx) + a)(fx)^m}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b\,\mathrm{asin}(cx))}{d + ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral((f*x)**m*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin(cx) + a)(fx)^m}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d), x)
```

3.658 $\int \frac{(fx)^m(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2, x]
```

Rubi [A] time = 0.0593164, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx = \int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$$

Mathematica [A] time = 10.292, size = 0, normalized size = 0.

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2, x]
```

Maple [A] time = 0.393, size = 0, normalized size = 0.

$$\int \frac{(fx)^m\left(a+b\arcsin(cx)\right)}{\left(ex^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

```
[Out] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)(fx)^m}{(ex^2 + d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(b \arcsin(cx) + a)(fx)^m}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)*(f*x)^m/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)(fx)^m}{(ex^2 + d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

3.659 $\int (d+ex^2)^3 (a+b\sin^{-1}(cx))^2 \, dx$

Optimal. Leaf size=569

$$\frac{2bd^2ex^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3c}+\frac{4bd^2e\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3c^3}+\frac{2bd^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c}+\frac{6bde^2x^4}{}$$

```
[Out] -2*b^2*d^3*x - (4*b^2*d^2*e*x)/(3*c^2) - (16*b^2*d*e^2*x)/(25*c^4) - (32*b^
2*e^3*x)/(245*c^6) - (2*b^2*d^2*e*x^3)/9 - (8*b^2*d*e^2*x^3)/(75*c^2) - (16
*b^2*e^3*x^3)/(735*c^4) - (6*b^2*d*e^2*x^5)/125 - (12*b^2*e^3*x^5)/(1225*c^
2) - (2*b^2*e^3*x^7)/343 + (2*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
c + (4*b*d^2*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^3) + (16*b*d*e^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c^5) + (32*b*e^3*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/(245*c^7) + (2*b*d^2*e*x^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x]))/(3*c) + (8*b*d*e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(25*c^3) + (16*b*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^5
) + (6*b*d*e^2*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + (12*b*e^
3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^3) + (2*b*e^3*x^6*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(49*c) + d^3*x*(a + b*ArcSin[c*x])^2 + d^
2*e*x^3*(a + b*ArcSin[c*x])^2 + (3*d*e^2*x^5*(a + b*ArcSin[c*x])^2)/5 + (e^
3*x^7*(a + b*ArcSin[c*x])^2)/7
```

Rubi [A] time = 0.96268, antiderivative size = 569, normalized size of antiderivative = 1., number of steps used = 26, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {4667, 4619, 4677, 8, 4627, 4707, 30}

$$\frac{2bd^2ex^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3c}+\frac{4bd^2e\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3c^3}+\frac{2bd^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c}+\frac{6bde^2x^4}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```


```
[Out] -2*b^2*d^3*x - (4*b^2*d^2*e*x)/(3*c^2) - (16*b^2*d*e^2*x)/(25*c^4) - (32*b^
2*e^3*x)/(245*c^6) - (2*b^2*d^2*e*x^3)/9 - (8*b^2*d*e^2*x^3)/(75*c^2) - (16
*b^2*e^3*x^3)/(735*c^4) - (6*b^2*d*e^2*x^5)/125 - (12*b^2*e^3*x^5)/(1225*c^
2) - (2*b^2*e^3*x^7)/343 + (2*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
c + (4*b*d^2*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^3) + (16*b*d*e^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c^5) + (32*b*e^3*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/(245*c^7) + (2*b*d^2*e*x^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x]))/(3*c) + (8*b*d*e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(25*c^3) + (16*b*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^5
) + (6*b*d*e^2*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + (12*b*e^
3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^3) + (2*b*e^3*x^6*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(49*c) + d^3*x*(a + b*ArcSin[c*x])^2 + d^
2*e*x^3*(a + b*ArcSin[c*x])^2 + (3*d*e^2*x^5*(a + b*ArcSin[c*x])^2)/5 + (e^
3*x^7*(a + b*ArcSin[c*x])^2)/7
```


Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2 dx = \int \left(d^3\left(a+b\sin^{-1}(cx)\right)^2 + 3d^2ex^2\left(a+b\sin^{-1}(cx)\right)^2 + 3de^2x^4\left(a+b\sin^{-1}(cx)\right)^2\right.$$

$$= d^3\int \left(a+b\sin^{-1}(cx)\right)^2 dx + \left(3d^2e\right)\int x^2\left(a+b\sin^{-1}(cx)\right)^2 dx + \left(3de^2\right)\int x^4 \left(\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)^2 + d^2ex^3\left(a+b\sin^{-1}(cx)\right)^2 + \frac{3}{5}de^2x^5\left(a+b\sin^{-1}(cx)\right)^2 +$$

$$= \frac{2bd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c} + \frac{2bd^2ex^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c} + \frac{6bde^2x}{}$$

$$= -2b^2d^3x - \frac{2}{9}b^2d^2ex^3 - \frac{6}{125}b^2de^2x^5 - \frac{2}{343}b^2e^3x^7 + \frac{2bd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{c}$$

$$= -2b^2d^3x - \frac{4b^2d^2ex}{3c^2} - \frac{2}{9}b^2d^2ex^3 - \frac{8b^2de^2x^3}{75c^2} - \frac{6}{125}b^2de^2x^5 - \frac{12b^2e^3x^5}{1225c^2} - \frac{2}{343}b^2e$$

$$= -2b^2d^3x - \frac{4b^2d^2ex}{3c^2} - \frac{16b^2de^2x}{25c^4} - \frac{2}{9}b^2d^2ex^3 - \frac{8b^2de^2x^3}{75c^2} - \frac{16b^2e^3x^3}{735c^4} - \frac{6}{125}b^2de^2$$

$$= -2b^2d^3x - \frac{4b^2d^2ex}{3c^2} - \frac{16b^2de^2x}{25c^4} - \frac{32b^2e^3x}{245c^6} - \frac{2}{9}b^2d^2ex^3 - \frac{8b^2de^2x^3}{75c^2} - \frac{16b^2e^3x^3}{735c^4} -$$

Mathematica [A] time = 0.493539, size = 435, normalized size = 0.76

$$-\frac{2bd^2e\left(-3a\sqrt{1-c^2x^2}\left(c^2x^2+2\right)+bcx\left(c^2x^2+6\right)-3b\sqrt{1-c^2x^2}\left(c^2x^2+2\right)\sin^{-1}(cx)\right)}{9c^3} - 2bd^3\left(bx - \frac{\sqrt{1-c^2x^2}\left(a+b\right.}{c}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d^3*x*(a + b*ArcSin[c*x])^2 + d^2*e*x^3*(a + b*ArcSin[c*x])^2 + (3*d*e^2*x^
5*(a + b*ArcSin[c*x])^2)/5 + (e^3*x^7*(a + b*ArcSin[c*x])^2)/7 - (2*b*d^2*e
*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 + c^2*x^2) - 3*b*Sqrt[1 -
 c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(9*c^3) - (2*b*d*e^2*(-15*a*Sqrt[1 -
c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) + b*c*x*(120 + 20*c^2*x^2 + 9*c^4*x^4)
 - 15*b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]))/(375*c^
5) - (2*b*e^3*(-105*a*Sqrt[1 - c^2*x^2]*(16 + 8*c^2*x^2 + 6*c^4*x^4 + 5*c^6
*x^6) + b*c*x*(1680 + 280*c^2*x^2 + 126*c^4*x^4 + 75*c^6*x^6) - 105*b*Sqrt[
1 - c^2*x^2]*(16 + 8*c^2*x^2 + 6*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]))/(25725*
c^7) - 2*b*d^3*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c)
```

Maple [B] time = 0.125, size = 1194, normalized size = 2.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(a^2/c^6*(1/7*e^3*c^7*x^7+3/5*c^7*d*e^2*x^5+c^7*d^2*e*x^3+d^3*c^7*x)+b^
2/c^6*(1/385875*e^3*(55125*arcsin(c*x)^2*c^7*x^7+15750*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*c^6*x^6-231525*arcsin(c*x)^2*c^5*x^5-2250*c^7*x^7-73710*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4+385875*c^3*x^3*arcsin(c*x)^2+14742*c^5*x^5+1
```

```
58970*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-385875*arcsin(c*x)^2*c*x-52990
*c^3*x^3-453810*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+453810*c*x)+1/1125*c^2*d*e^2
*(675*arcsin(c*x)^2*c^5*x^5+270*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4-2250
*c^3*x^3*arcsin(c*x)^2-54*c^5*x^5-1140*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x
^2+3375*arcsin(c*x)^2*c*x+380*c^3*x^3+4470*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-4
470*c*x)+1/1125*e^3*(675*arcsin(c*x)^2*c^5*x^5+270*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)*c^4*x^4-2250*c^3*x^3*arcsin(c*x)^2-54*c^5*x^5-1140*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)*c^2*x^2+3375*arcsin(c*x)^2*c*x+380*c^3*x^3+4470*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)-4470*c*x)+1/9*c^4*d^2*e*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*arcsin(c*x)^2*c*x-2*c^3*x^3-42*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+2/9*c^2*d*e^2*(9*c^3*x^3*arcsin(c*x)^2+6*arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*arcsin(c*x)^2*c*x-2*c^3*x^3-42*arcsi
n(c*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+1/9*e^3*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*arcsin(c*x)^2*c*x-2*c^3*x^3-42*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+d^3*c^6*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*
x)*(-c^2*x^2+1)^(1/2))+3*c^4*d^2*e*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(
-c^2*x^2+1)^(1/2))+3*c^2*d*e^2*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2
*x^2+1)^(1/2))+e^3*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)))+2*a*b/c^6*(1/7*arcsin(c*x)*e^3*c^7*x^7+3/5*arcsin(c*x)*c^7*d*e^2*x^5+ar
csin(c*x)*c^7*d^2*e*x^3+arcsin(c*x)*d^3*c^7*x-1/7*e^3*(-1/7*c^6*x^6*(-c^2*x
^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)
-16/35*(-c^2*x^2+1)^(1/2))-3/5*c^2*d*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4
/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-c^4*d^2*e*(-1/3*c^2
*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+d^3*c^6*(-c^2*x^2+1)^(1/2))
)
```

Maxima [A] time = 1.52988, size = 944, normalized size = 1.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*e^3*x^7*arcsin(c*x)^2 + 1/7*a^2*e^3*x^7 + 3/5*b^2*d*e^2*x^5*arcsin(
c*x)^2 + 3/5*a^2*d*e^2*x^5 + b^2*d^2*e*x^3*arcsin(c*x)^2 + a^2*d^2*e*x^3 +
b^2*d^3*x*arcsin(c*x)^2 + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^
2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^2*e + 2/9*(3*c*(sqrt(-c^2*x^2 + 1)
*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2
*d^2*e + 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d*e^2 + 2/375*(15*
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*d*e
^2 + 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^
2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c
^8)*c)*a*b*e^3 + 2/25725*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x
^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)
*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2
*e^3 - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^3*x + 2*(c*
x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^3/c
```

Fricas [A] time = 2.25981, size = 1277, normalized size = 2.24

$$1125\left(49\,a^2-2\,b^2\right)c^7e^3x^7+189\left(49\left(25\,a^2-2\,b^2\right)c^7de^2-20\,b^2c^5e^3\right)x^5+35\left(1225\left(9\,a^2-2\,b^2\right)c^7d^2e-1176\,b^2c^5de^2-240\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/385875*(1125*(49*a^2 - 2*b^2)*c^7*e^3*x^7 + 189*(49*(25*a^2 - 2*b^2)*c^7*
d*e^2 - 20*b^2*c^5*e^3)*x^5 + 35*(1225*(9*a^2 - 2*b^2)*c^7*d^2*e - 1176*b^2
*c^5*d*e^2 - 240*b^2*c^3*e^3)*x^3 + 11025*(5*b^2*c^7*e^3*x^7 + 21*b^2*c^7*d
*e^2*x^5 + 35*b^2*c^7*d^2*e*x^3 + 35*b^2*c^7*d^3*x)*arcsin(c*x)^2 + 105*(36
75*(a^2 - 2*b^2)*c^7*d^3 - 4900*b^2*c^5*d^2*e - 2352*b^2*c^3*d*e^2 - 480*b^
2*c*e^3)*x + 22050*(5*a*b*c^7*e^3*x^7 + 21*a*b*c^7*d*e^2*x^5 + 35*a*b*c^7*d
^2*e*x^3 + 35*a*b*c^7*d^3*x)*arcsin(c*x) + 210*(75*a*b*c^6*e^3*x^6 + 3675*a
*b*c^6*d^3 + 2450*a*b*c^4*d^2*e + 1176*a*b*c^2*d*e^2 + 240*a*b*e^3 + 9*(49*
a*b*c^6*d*e^2 + 10*a*b*c^4*e^3)*x^4 + (1225*a*b*c^6*d^2*e + 588*a*b*c^4*d*e
^2 + 120*a*b*c^2*e^3)*x^2 + (75*b^2*c^6*e^3*x^6 + 3675*b^2*c^6*d^3 + 2450*b
^2*c^4*d^2*e + 1176*b^2*c^2*d*e^2 + 240*b^2*e^3 + 9*(49*b^2*c^6*d*e^2 + 10*
b^2*c^4*e^3)*x^4 + (1225*b^2*c^6*d^2*e + 588*b^2*c^4*d*e^2 + 120*b^2*c^2*e^
3)*x^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^7
```

Sympy [A] time = 17.9512, size = 989, normalized size = 1.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**3*x + a**2*d**2*e*x**3 + 3*a**2*d*e**2*x**5/5 + a**2*e**
3*x**7/7 + 2*a*b*d**3*x*asin(c*x) + 2*a*b*d**2*e*x**3*asin(c*x) + 6*a*b*d*e
**2*x**5*asin(c*x)/5 + 2*a*b*e**3*x**7*asin(c*x)/7 + 2*a*b*d**3*sqrt(-c**2*
x**2 + 1)/c + 2*a*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 6*a*b*d*e**2*x
**4*sqrt(-c**2*x**2 + 1)/(25*c) + 2*a*b*e**3*x**6*sqrt(-c**2*x**2 + 1)/(49*
c) + 4*a*b*d**2*e*sqrt(-c**2*x**2 + 1)/(3*c**3) + 8*a*b*d*e**2*x**2*sqrt(-c
**2*x**2 + 1)/(25*c**3) + 12*a*b*e**3*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3)
+ 16*a*b*d*e**2*sqrt(-c**2*x**2 + 1)/(25*c**5) + 16*a*b*e**3*x**2*sqrt(-c**
2*x**2 + 1)/(245*c**5) + 32*a*b*e**3*sqrt(-c**2*x**2 + 1)/(245*c**7) + b**2
*d**3*x*asin(c*x)**2 - 2*b**2*d**3*x + b**2*d**2*e*x**3*asin(c*x)**2 - 2*b*
*2*d**2*e*x**3/9 + 3*b**2*d*e**2*x**5*asin(c*x)**2/5 - 6*b**2*d*e**2*x**5/1
25 + b**2*e**3*x**7*asin(c*x)**2/7 - 2*b**2*e**3*x**7/343 + 2*b**2*d**3*sqr
t(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*d**2*e*x**2*sqrt(-c**2*x**2 + 1)*asi
n(c*x)/(3*c) + 6*b**2*d*e**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) + 2
*b**2*e**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/(49*c) - 4*b**2*d**2*e*x/(3*
c**2) - 8*b**2*d*e**2*x**3/(75*c**2) - 12*b**2*e**3*x**5/(1225*c**2) + 4*b*
*2*d**2*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c**3) + 8*b**2*d*e**2*x**2*sqrt
(-c**2*x**2 + 1)*asin(c*x)/(25*c**3) + 12*b**2*e**3*x**4*sqrt(-c**2*x**2 +
1)*asin(c*x)/(245*c**3) - 16*b**2*d*e**2*x/(25*c**4) - 16*b**2*e**3*x**3/(7
35*c**4) + 16*b**2*d*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c**5) + 16*b**
2*e**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(245*c**5) - 32*b**2*e**3*x/(245
*c**6) + 32*b**2*e**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(245*c**7), Ne(c, 0)),
 (a**2*(d**3*x + d**2*e*x**3 + 3*d*e**2*x**5/5 + e**3*x**7/7), True))
```

Giac [B] time = 1.38743, size = 1642, normalized size = 2.89

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/7*a^2*x^7*e^3 + 3/5*a^2*d*x^5*e^2 + b^2*d^3*x*arcsin(c*x)^2 + a^2*d^2*x^3
*e + 2*a*b*d^3*x*arcsin(c*x) + (c^2*x^2 - 1)*b^2*d^2*x*arcsin(c*x)^2*e/c^2
+ a^2*d^3*x - 2*b^2*d^3*x + 2*(c^2*x^2 - 1)*a*b*d^2*x*arcsin(c*x)*e/c^2 + b
^2*d^2*x*arcsin(c*x)^2*e/c^2 + 2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c +
 3/5*(c^2*x^2 - 1)^2*b^2*d*x*arcsin(c*x)^2*e^2/c^4 - 2/9*(c^2*x^2 - 1)*b^2*
d^2*x*e/c^2 + 2*a*b*d^2*x*arcsin(c*x)*e/c^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d^3/
c - 2/3*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*arcsin(c*x)*e/c^3 + 6/5*(c^2*x^2 - 1)^
2*a*b*d*x*arcsin(c*x)*e^2/c^4 + 6/5*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*x)^2*e^2
/c^4 - 14/9*b^2*d^2*x*e/c^2 - 2/3*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*e/c^3 + 2*sq
rt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)*e/c^3 + 1/7*(c^2*x^2 - 1)^3*b^2*x*arcs
in(c*x)^2*e^3/c^6 - 6/125*(c^2*x^2 - 1)^2*b^2*d*x*e^2/c^4 + 12/5*(c^2*x^2 -
 1)*a*b*d*x*arcsin(c*x)*e^2/c^4 + 3/5*b^2*d*x*arcsin(c*x)^2*e^2/c^4 + 6/25*
(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)*e^2/c^5 + 2*sqrt(-c^2*
x^2 + 1)*a*b*d^2*e/c^3 + 2/7*(c^2*x^2 - 1)^3*a*b*x*arcsin(c*x)*e^3/c^6 + 3/
7*(c^2*x^2 - 1)^2*b^2*x*arcsin(c*x)^2*e^3/c^6 - 76/375*(c^2*x^2 - 1)*b^2*d*
x*e^2/c^4 + 6/5*a*b*d*x*arcsin(c*x)*e^2/c^4 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^
2*x^2 + 1)*a*b*d*e^2/c^5 - 4/5*(-c^2*x^2 + 1)^(3/2)*b^2*d*arcsin(c*x)*e^2/c
^5 - 2/343*(c^2*x^2 - 1)^3*b^2*x*e^3/c^6 + 6/7*(c^2*x^2 - 1)^2*a*b*x*arcsin
(c*x)*e^3/c^6 + 3/7*(c^2*x^2 - 1)*b^2*x*arcsin(c*x)^2*e^3/c^6 - 298/375*b^2
*d*x*e^2/c^4 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*arcsin(c*x)*e^3/
c^7 - 4/5*(-c^2*x^2 + 1)^(3/2)*a*b*d*e^2/c^5 + 6/5*sqrt(-c^2*x^2 + 1)*b^2*d
*arcsin(c*x)*e^2/c^5 - 234/8575*(c^2*x^2 - 1)^2*b^2*x*e^3/c^6 + 6/7*(c^2*x^
2 - 1)*a*b*x*arcsin(c*x)*e^3/c^6 + 1/7*b^2*x*arcsin(c*x)^2*e^3/c^6 + 2/49*(
c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7 + 6/35*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b^2*arcsin(c*x)*e^3/c^7 + 6/5*sqrt(-c^2*x^2 + 1)*a*b*d*e^2/c^5
 - 1514/25725*(c^2*x^2 - 1)*b^2*x*e^3/c^6 + 2/7*a*b*x*arcsin(c*x)*e^3/c^6 +
 6/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7 - 2/7*(-c^2*x^2 + 1)^(
3/2)*b^2*arcsin(c*x)*e^3/c^7 - 4322/25725*b^2*x*e^3/c^6 - 2/7*(-c^2*x^2 + 1
)^(3/2)*a*b*e^3/c^7 + 2/7*sqrt(-c^2*x^2 + 1)*b^2*arcsin(c*x)*e^3/c^7 + 2/7*
sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7
```

3.660 $\int \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=335

$$\frac{2bd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{4bdex^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c}+\frac{8bde\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3}+\frac{2be^2x^4\sqrt{1}}{}$$

```
[Out] -2*b^2*d^2*x - (8*b^2*d*e*x)/(9*c^2) - (16*b^2*e^2*x)/(75*c^4) - (4*b^2*d*e
*x^3)/27 - (8*b^2*e^2*x^3)/(225*c^2) - (2*b^2*e^2*x^5)/125 + (2*b*d^2*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (8*b*d*e*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x]))/(9*c^3) + (16*b*e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c
^5) + (4*b*d*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + (8*b*e^2*
x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^3) + (2*b*e^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + d^2*x*(a + b*ArcSin[c*x])^2 + (2*d*
e*x^3*(a + b*ArcSin[c*x])^2)/3 + (e^2*x^5*(a + b*ArcSin[c*x])^2)/5
```

Rubi [A] time = 0.556517, antiderivative size = 335, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {4667, 4619, 4677, 8, 4627, 4707, 30}

$$\frac{2bd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{4bdex^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c}+\frac{8bde\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c^3}+\frac{2be^2x^4\sqrt{1}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d^2*x - (8*b^2*d*e*x)/(9*c^2) - (16*b^2*e^2*x)/(75*c^4) - (4*b^2*d*e
*x^3)/27 - (8*b^2*e^2*x^3)/(225*c^2) - (2*b^2*e^2*x^5)/125 + (2*b*d^2*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (8*b*d*e*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x]))/(9*c^3) + (16*b*e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c
^5) + (4*b*d*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + (8*b*e^2*
x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^3) + (2*b*e^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + d^2*x*(a + b*ArcSin[c*x])^2 + (2*d*
e*x^3*(a + b*ArcSin[c*x])^2)/3 + (e^2*x^5*(a + b*ArcSin[c*x])^2)/5
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
```

```
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2 dx = \int \left(d^2 \left(a+b\sin^{-1}(cx)\right)^2 + 2dex^2 \left(a+b\sin^{-1}(cx)\right)^2 + e^2x^4 \left(a+b\sin^{-1}(cx)\right)^2\right) dx$$

$$= d^2 \int \left(a+b\sin^{-1}(cx)\right)^2 dx + (2de) \int x^2 \left(a+b\sin^{-1}(cx)\right)^2 dx + e^2 \int x^4 \left(a+b\sin^{-1}\right.$$

$$= d^2x \left(a+b\sin^{-1}(cx)\right)^2 + \frac{2}{3}dex^3 \left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{5}e^2x^5 \left(a+b\sin^{-1}(cx)\right)^2 - \left(2bc\right.$$

$$= \frac{2bd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c} + \frac{4bdex^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c} + \frac{2be^2x^4\sqrt{1}\ldots}{}$$

$$= -2b^2d^2x - \frac{4}{27}b^2dex^3 - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c} + \frac{8bde\sqrt{1-c}\ldots}{}$$

$$= -2b^2d^2x - \frac{8b^2dex}{9c^2} - \frac{4}{27}b^2dex^3 - \frac{8b^2e^2x^3}{225c^2} - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}\left(a+b\sin\ldots\right.}{c}$$

$$= -2b^2d^2x - \frac{8b^2dex}{9c^2} - \frac{16b^2e^2x}{75c^4} - \frac{4}{27}b^2dex^3 - \frac{8b^2e^2x^3}{225c^2} - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}}{}$$

Mathematica [A] time = 0.321287, size = 291, normalized size = 0.87

$$\frac{225a^2c^5x\left(15d^2+10dex^2+3e^2x^4\right)+30ab\sqrt{1-c^2x^2}\left(c^4\left(225d^2+50dex^2+9e^2x^4\right)+4c^2e\left(25d+3ex^2\right)+24e^2\right)+30b\sin\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (225*a^2*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) + 30*a*b*Sqrt[1 - c^2*x^2]
*(24*e^2 + 4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*d*e*x^2 + 9*e^2*x^4
)) - 2*b^2*c*x*(360*e^2 + 60*c^2*e*(25*d + e*x^2) + c^4*(3375*d^2 + 250*d*e
*x^2 + 27*e^2*x^4)) + 30*b*(15*a*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) +
b*Sqrt[1 - c^2*x^2]*(24*e^2 + 4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*
d*e*x^2 + 9*e^2*x^4)))*ArcSin[c*x] + 225*b^2*c^5*x*(15*d^2 + 10*d*e*x^2 + 3
*e^2*x^4)*ArcSin[c*x]^2)/(3375*c^5)
```

Maple [B] time = 0.075, size = 635, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(a^2/c^4*(1/5*e^2*c^5*x^5+2/3*c^5*e*d*x^3+d^2*c^5*x)+b^2/c^4*(1/3375*e^
2*(675*arcsin(c*x)^2*c^5*x^5+270*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4-225
0*c^3*x^3*arcsin(c*x)^2-54*c^5*x^5-1140*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*
x^2+3375*arcsin(c*x)^2*c*x+380*c^3*x^3+4470*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-
4470*c*x)+2/27*c^2*e*d*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*c^2*x^2-27*arcsin(c*x)^2*c*x-2*c^3*x^3-42*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)+42*c*x)+2/27*e^2*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*c^2*x^2-27*arcsin(c*x)^2*c*x-2*c^3*x^3-42*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)+42*c*x)+d^2*c^4*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
)+2*c^2*e*d*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+e^2*
(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)))+2*a*b/c^4*(1/5*
arcsin(c*x)*e^2*c^5*x^5+2/3*arcsin(c*x)*c^5*e*d*x^3+arcsin(c*x)*d^2*c^5*x-1
/5*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/1
5*(-c^2*x^2+1)^(1/2))-2/3*c^2*e*d*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^
2*x^2+1)^(1/2))+d^2*c^4*(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.48144, size = 590, normalized size = 1.76

$$\frac{1}{5}\,b^2e^2x^5\arcsin\left(cx\right)^2+\frac{1}{5}\,a^2e^2x^5+\frac{2}{3}\,b^2dex^3\arcsin\left(cx\right)^2+\frac{2}{3}\,a^2dex^3+b^2d^2x\arcsin\left(cx\right)^2+\frac{4}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\sqrt{\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*e^2*x^5*arcsin(c*x)^2 + 1/5*a^2*e^2*x^5 + 2/3*b^2*d*e*x^3*arcsin(c*
x)^2 + 2/3*a^2*d*e*x^3 + b^2*d^2*x*arcsin(c*x)^2 + 4/9*(3*x^3*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d*e + 4/27*
(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) -
(c^2*x^3 + 6*x)/c^2)*b^2*d*e + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2
+ 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*
a*b*e^2 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x
^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3
+ 120*x)/c^4)*b^2*e^2 - 2*b^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) +
a^2*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^2/c
```

Fricas [A] time = 2.18965, size = 790, normalized size = 2.36

$$\frac{27\left(25\,a^2-2\,b^2\right)c^5e^2x^5+10\left(25\left(9\,a^2-2\,b^2\right)c^5de-12\,b^2c^3e^2\right)x^3+225\left(3\,b^2c^5e^2x^5+10\,b^2c^5dex^3+15\,b^2c^5d^2x\right)\arcsin(cx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/3375*(27*(25*a^2 - 2*b^2)*c^5*e^2*x^5 + 10*(25*(9*a^2 - 2*b^2)*c^5*d*e -
12*b^2*c^3*e^2)*x^3 + 225*(3*b^2*c^5*e^2*x^5 + 10*b^2*c^5*d*e*x^3 + 15*b^2*
c^5*d^2*x)*arcsin(c*x)^2 + 15*(225*(a^2 - 2*b^2)*c^5*d^2 - 200*b^2*c^3*d*e
- 48*b^2*c*e^2)*x + 450*(3*a*b*c^5*e^2*x^5 + 10*a*b*c^5*d*e*x^3 + 15*a*b*c^
5*d^2*x)*arcsin(c*x) + 30*(9*a*b*c^4*e^2*x^4 + 225*a*b*c^4*d^2 + 100*a*b*c^
2*d*e + 24*a*b*e^2 + 2*(25*a*b*c^4*d*e + 6*a*b*c^2*e^2)*x^2 + (9*b^2*c^4*e^
2*x^4 + 225*b^2*c^4*d^2 + 100*b^2*c^2*d*e + 24*b^2*e^2 + 2*(25*b^2*c^4*d*e
+ 6*b^2*c^2*e^2)*x^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] time = 6.24232, size = 595, normalized size = 1.78

$$\begin{cases} a^2d^2x+\frac{2a^2dex^3}{3}+\frac{a^2e^2x^5}{5}+2abd^2x\operatorname{asin}(cx)+\frac{4abdex^3\operatorname{asin}(cx)}{3}+\frac{2abe^2x^5\operatorname{asin}(cx)}{5}+\frac{2abd^2\sqrt{-c^2x^2+1}}{c}+\frac{4abdex^2\sqrt{-c^2x^2+1}}{9c}+\frac{2abe^2x^4\sqrt{-c}}{25c} \\ a^2\left(d^2x+\frac{2dex^3}{3}+\frac{e^2x^5}{5}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**2*x + 2*a**2*d*e*x**3/3 + a**2*e**2*x**5/5 + 2*a*b*d**2*
x*asin(c*x) + 4*a*b*d*e*x**3*asin(c*x)/3 + 2*a*b*e**2*x**5*asin(c*x)/5 + 2*
a*b*d**2*sqrt(-c**2*x**2 + 1)/c + 4*a*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c)
 + 2*a*b*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 8*a*b*d*e*sqrt(-c**2*x**2
+ 1)/(9*c**3) + 8*a*b*e**2*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 16*a*b*e**
2*sqrt(-c**2*x**2 + 1)/(75*c**5) + b**2*d**2*x*asin(c*x)**2 - 2*b**2*d**2*x
 + 2*b**2*d*e*x**3*asin(c*x)**2/3 - 4*b**2*d*e*x**3/27 + b**2*e**2*x**5*asi
n(c*x)**2/5 - 2*b**2*e**2*x**5/125 + 2*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(
c*x)/c + 4*b**2*d*e*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c) + 2*b**2*e**2
*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) - 8*b**2*d*e*x/(9*c**2) - 8*b**
2*e**2*x**3/(225*c**2) + 8*b**2*d*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3)
 + 8*b**2*e**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**3) - 16*b**2*e**2
*x/(75*c**4) + 16*b**2*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**5), Ne(c,
 0)), (a**2*(d**2*x + 2*d*e*x**3/3 + e**2*x**5/5), True))
```

Giac [B] time = 1.33001, size = 915, normalized size = 2.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/5*a^2*x^5*e^2 + b^2*d^2*x*arcsin(c*x)^2 + 2/3*a^2*d*x^3*e + 2*a*b*d^2*x*a
rcsin(c*x) + 2/3*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*x)^2*e/c^2 + a^2*d^2*x - 2*
b^2*d^2*x + 4/3*(c^2*x^2 - 1)*a*b*d*x*arcsin(c*x)*e/c^2 + 2/3*b^2*d*x*arcsi
```

```
n(c*x)^2*e/c^2 + 2*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c + 1/5*(c^2*x^2
- 1)^2*b^2*x*arcsin(c*x)^2*e^2/c^4 - 4/27*(c^2*x^2 - 1)*b^2*d*x*e/c^2 + 4/3
*a*b*d*x*arcsin(c*x)*e/c^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d^2/c - 4/9*(-c^2*x^2
 + 1)^(3/2)*b^2*d*arcsin(c*x)*e/c^3 + 2/5*(c^2*x^2 - 1)^2*a*b*x*arcsin(c*x)
*e^2/c^4 + 2/5*(c^2*x^2 - 1)*b^2*x*arcsin(c*x)^2*e^2/c^4 - 28/27*b^2*d*x*e/
c^2 - 4/9*(-c^2*x^2 + 1)^(3/2)*a*b*d*e/c^3 + 4/3*sqrt(-c^2*x^2 + 1)*b^2*d*a
rcsin(c*x)*e/c^3 - 2/125*(c^2*x^2 - 1)^2*b^2*x*e^2/c^4 + 4/5*(c^2*x^2 - 1)*
a*b*x*arcsin(c*x)*e^2/c^4 + 1/5*b^2*x*arcsin(c*x)^2*e^2/c^4 + 2/25*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*arcsin(c*x)*e^2/c^5 + 4/3*sqrt(-c^2*x^2 + 1)
*a*b*d*e/c^3 - 76/1125*(c^2*x^2 - 1)*b^2*x*e^2/c^4 + 2/5*a*b*x*arcsin(c*x)*
e^2/c^4 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^5 - 4/15*(-c^2*
x^2 + 1)^(3/2)*b^2*arcsin(c*x)*e^2/c^5 - 298/1125*b^2*x*e^2/c^4 - 4/15*(-c^
2*x^2 + 1)^(3/2)*a*b*e^2/c^5 + 2/5*sqrt(-c^2*x^2 + 1)*b^2*arcsin(c*x)*e^2/c
^5 + 2/5*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^5
```

3.661 $\int (d+ex^2) (a+b\sin^{-1}(cx))^2 \, dx$

Optimal. Leaf size=156

$$\frac{2bd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c}+\frac{2bex^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c}+\frac{4be\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^3}+dx\,(a+b\sin^{-1}(c$$

```
[Out] -2*b^2*d*x - (4*b^2*e*x)/(9*c^2) - (2*b^2*e*x^3)/27 + (2*b*d*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/c + (4*b*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(9*c^3) + (2*b*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + d*x*(a
+ b*ArcSin[c*x])^2 + (e*x^3*(a + b*ArcSin[c*x])^2)/3
```

Rubi [A] time = 0.261411, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4667, 4619, 4677, 8, 4627, 4707, 30}

$$\frac{2bd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c}+\frac{2bex^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c}+\frac{4be\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^3}+dx\,(a+b\sin^{-1}(c$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d*x - (4*b^2*e*x)/(9*c^2) - (2*b^2*e*x^3)/27 + (2*b*d*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/c + (4*b*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(9*c^3) + (2*b*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + d*x*(a
+ b*ArcSin[c*x])^2 + (e*x^3*(a + b*ArcSin[c*x])^2)/3
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4627

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^n)/(d*(m + 1)), x] - Dist[(b*c*n
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2
*x^2], x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx &= \int \left(d\left(a+b\sin^{-1}(cx)\right)^2+ex^2\left(a+b\sin^{-1}(cx)\right)^2\right)dx \\
&= d\int \left(a+b\sin^{-1}(cx)\right)^2\,dx+e\int x^2\left(a+b\sin^{-1}(cx)\right)^2\,dx \\
&= dx\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)^2-(2bcd)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{2bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{2bex^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c}+dx\left(a+b\,\mathrm{si}\right. \\
&= -2b^2dx-\frac{2}{27}b^2ex^3+\frac{2bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{4be\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\right.}{9c^3} \\
&= -2b^2dx-\frac{4b^2ex}{9c^2}-\frac{2}{27}b^2ex^3+\frac{2bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{4be\sqrt{1-c^2x^2}\left(a\right.}{9c^3}
\end{aligned}
$$

Mathematica [A] time = 0.24365, size = 148, normalized size = 0.95

$$
-2bd\left(bx-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}\right)-\frac{2}{27}be\left(-\frac{3x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{6\left(\frac{bx}{c}-\frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c^2}\right)}{c}+b\right.
$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d*x*(a + b*ArcSin[c*x])^2 + (e*x^3*(a + b*ArcSin[c*x])^2)/3 - 2*b*d*(b*x -
(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (2*b*e*(b*x^3 - (3*x^2*Sqrt[1
- c^2*x^2]*(a + b*ArcSin[c*x]))/c + (6*((b*x)/c - (Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x]))/c^2))/c))/27
```

Maple [A] time = 0.049, size = 276, normalized size = 1.8

$$\frac{1}{c}\left(\frac{a^2}{c^2}\left(\frac{c^3x^3e}{3}+dc^3x\right)+\frac{b^2}{c^2}\left(\frac{e}{27}\left(9\,c^3x^3\left(\arcsin\left(cx\right)\right)^2+6\,\arcsin\left(cx\right)\sqrt{-c^2x^2+1}c^2x^2-27\,\left(\arcsin\left(cx\right)\right)^2cx-2\,c^3x^3-42\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(a^2/c^2*(1/3*c^3*x^3*e+d*c^3*x)+b^2/c^2*(1/27*e*(9*c^3*x^3*arcsin(c*x)
^2+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*arcsin(c*x)^2*c*x-2*c^3*x^3-
42*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+c^2*d*(arcsin(c*x)^2*c*x-2*c*x+2*
arcsin(c*x)*(-c^2*x^2+1)^(1/2))+e*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)))+2*a*b/c^2*(1/3*arcsin(c*x)*c^3*x^3*e+arcsin(c*x)*d*c^3*x
-1/3*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+c^2*d*(-c^2
*x^2+1)^(1/2)))
```

Maxima [A] time = 1.44661, size = 298, normalized size = 1.91

$$\frac{1}{3}\,b^2ex^3\arcsin\left(cx\right)^2+\frac{1}{3}\,a^2ex^3+b^2dx\arcsin\left(cx\right)^2+\frac{2}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)abe+\frac{2}{27}\left(3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*e*x^3*arcsin(c*x)^2 + 1/3*a^2*e*x^3 + b^2*d*x*arcsin(c*x)^2 + 2/9*(
3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^
4))*a*b*e + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^
4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2*e - 2*b^2*d*(x - sqrt(-c^2*x^2 +
1)*arcsin(c*x)/c) + a^2*d*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*
d/c
```

Fricas [A] time = 2.03491, size = 400, normalized size = 2.56

$$\frac{\left(9\,a^2-2\,b^2\right)c^3ex^3+9\left(b^2c^3ex^3+3\,b^2c^3dx\right)\arcsin\left(cx\right)^2+3\left(9\left(a^2-2\,b^2\right)c^3d-4\,b^2ce\right)x+18\left(abc^3ex^3+3\,abc^3dx\right)\arcsin}{27\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27*((9*a^2 - 2*b^2)*c^3*e*x^3 + 9*(b^2*c^3*e*x^3 + 3*b^2*c^3*d*x)*arcsin(
c*x)^2 + 3*(9*(a^2 - 2*b^2)*c^3*d - 4*b^2*c*e)*x + 18*(a*b*c^3*e*x^3 + 3*a*
b*c^3*d*x)*arcsin(c*x) + 6*(a*b*c^2*e*x^2 + 9*a*b*c^2*d + 2*a*b*e + (b^2*c^
2*e*x^2 + 9*b^2*c^2*d + 2*b^2*e)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] time = 1.59377, size = 279, normalized size = 1.79

$$\begin{cases} a^2dx+\frac{a^2ex^3}{3}+2abdx\operatorname{asin}\left(cx\right)+\frac{2abex^3\operatorname{asin}\left(cx\right)}{3}+\frac{2abd\sqrt{-c^2x^2+1}}{c}+\frac{2abex^2\sqrt{-c^2x^2+1}}{9c}+\frac{4abe\sqrt{-c^2x^2+1}}{9c^3}+b^2dx\operatorname{asin}^2\left(cx\right)-2b^2dx+ \\ a^2\left(dx+\frac{ex^3}{3}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*x + a**2*e*x**3/3 + 2*a*b*d*x*asin(c*x) + 2*a*b*e*x**3*as
in(c*x)/3 + 2*a*b*d*sqrt(-c**2*x**2 + 1)/c + 2*a*b*e*x**2*sqrt(-c**2*x**2 +
 1)/(9*c) + 4*a*b*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + b**2*d*x*asin(c*x)**2 -
 2*b**2*d*x + b**2*e*x**3*asin(c*x)**2/3 - 2*b**2*e*x**3/27 + 2*b**2*d*sqrt
(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*e*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)
/(9*c) - 4*b**2*e*x/(9*c**2) + 4*b**2*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c
**3), Ne(c, 0)), (a**2*(d*x + e*x**3/3), True))
```

Giac [B] time = 1.32157, size = 400, normalized size = 2.56

$$b^2dx\arcsin(cx)^2 + \frac{1}{3}a^2x^3e + 2\,abdx\arcsin(cx) + \frac{(c^2x^2-1)b^2x\arcsin(cx)^2e}{3\,c^2} + a^2dx - 2\,b^2dx + \frac{2\,(c^2x^2-1)abx\arcsin}{3\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b^2*d*x*arcsin(c*x)^2 + 1/3*a^2*x^3*e + 2*a*b*d*x*arcsin(c*x) + 1/3*(c^2*x^
2 - 1)*b^2*x*arcsin(c*x)^2*e/c^2 + a^2*d*x - 2*b^2*d*x + 2/3*(c^2*x^2 - 1)*
a*b*x*arcsin(c*x)*e/c^2 + 1/3*b^2*x*arcsin(c*x)^2*e/c^2 + 2*sqrt(-c^2*x^2 +
 1)*b^2*d*arcsin(c*x)/c - 2/27*(c^2*x^2 - 1)*b^2*x*e/c^2 + 2/3*a*b*x*arcsin
(c*x)*e/c^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d/c - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*a
rcsin(c*x)*e/c^3 - 14/27*b^2*x*e/c^2 - 2/9*(-c^2*x^2 + 1)^(3/2)*a*b*e/c^3 +
 2/3*sqrt(-c^2*x^2 + 1)*b^2*arcsin(c*x)*e/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*
e/c^3
```

3.662 $\int \left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=47

$$\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+x\left(a+b\sin^{-1}(cx)\right)^2-2b^2x$$

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Rubi [A] time = 0.0601597, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {4619, 4677, 8}

$$\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+x\left(a+b\sin^{-1}(cx)\right)^2-2b^2x$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rubi steps

$$\begin{aligned}
\int \left(a+b\sin^{-1}(cx)\right)^2\,dx &= x\left(a+b\sin^{-1}(cx)\right)^2-(2bc)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx\\
&= \frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+x\left(a+b\sin^{-1}(cx)\right)^2-\left(2b^2\right)\int 1\,dx\\
&= -2b^2x+\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+x\left(a+b\sin^{-1}(cx)\right)^2
\end{aligned}$$

Mathematica [A] time = 0.0419909, size = 47, normalized size = 1.

$$\frac{2b\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+x\left(a+b\sin^{-1}(cx)\right)^2-2b^2x$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Maple [A] time = 0.042, size = 72, normalized size = 1.5

$$\frac{1}{c}\left(a^2cx+b^2\left((\arcsin(cx))^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(a^2*c*x+b^2*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))
+2*a*b*(c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)))
```

Maxima [A] time = 1.41466, size = 97, normalized size = 2.06

$$b^2x\arcsin(cx)^2-2b^2\left(x-\frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right)+a^2x+\frac{2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)ab}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] b^2*x*arcsin(c*x)^2 - 2*b^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*x
+ 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b/c
```

Fricas [A] time = 1.97223, size = 159, normalized size = 3.38

$$\frac{b^2cx\arcsin(cx)^2+2\,abcx\arcsin(cx)+\left(a^2-2\,b^2\right)cx+2\sqrt{-c^2x^2+1}\left(b^2\arcsin(cx)+ab\right)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] (b^2*c*x*arcsin(c*x)^2 + 2*a*b*c*x*arcsin(c*x) + (a^2 - 2*b^2)*c*x + 2*sqrt
(-c^2*x^2 + 1)*(b^2*arcsin(c*x) + a*b))/c
```

Sympy [A] time = 0.300995, size = 82, normalized size = 1.74

$$\begin{cases} a^2x + 2abx\operatorname{asin}(cx) + \frac{2ab\sqrt{-c^2x^2+1}}{c} + b^2x\operatorname{asin}^2(cx) - 2b^2x + \frac{2b^2\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{c} & \text{for } c \neq 0 \\ a^2x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*x + 2*a*b*x*asin(c*x) + 2*a*b*sqrt(-c**2*x**2 + 1)/c + b**2
*x*asin(c*x)**2 - 2*b**2*x + 2*b**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c, Ne(c,
 0)), (a**2*x, True))
```

Giac [A] time = 1.27016, size = 101, normalized size = 2.15

$$b^2x\arcsin(cx)^2 + 2\,abx\arcsin(cx) + a^2x - 2\,b^2x + \frac{2\,\sqrt{-c^2x^2+1}b^2\arcsin(cx)}{c} + \frac{2\,\sqrt{-c^2x^2+1}ab}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x - 2*b^2*x + 2*sqrt(-c^2*x
^2 + 1)*b^2*arcsin(c*x)/c + 2*sqrt(-c^2*x^2 + 1)*a*b/c
```

3.663 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d+ex^2}\,dx$

Optimal. Leaf size=821

$$-\frac{\text{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}}+\frac{\text{PolyLog}\left(3,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}}-\frac{\text{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}}+\cdots$$

```
[Out] ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*Log[1 + (S
qrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sq
rt[e]) + ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sq
rt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - (I*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sq
rt[e]) - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt
[e]) + (b^2*PolyLog[3, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2
*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) + (b^2*PolyLog[3,
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*S
qrt[e])
```

Rubi [A] time = 1.34202, antiderivative size = 821, normalized size of antiderivative = 1., number of steps used = 22, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {4667, 4741, 4521, 2190, 2531, 2282, 6589}

$$-\frac{\text{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}}+\frac{\text{PolyLog}\left(3,\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}}-\frac{\text{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2),x]
```


```
[Out] ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*Log[1 + (S
qrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sq
rt[e]) + ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sq
rt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - (I*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sq
rt[e]) - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt
[e]) + (b^2*PolyLog[3, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2
```

```
*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) + (b^2*PolyLog[3,
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*S
qrt[e])
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[((a + b*x)^n*Cos[x])/(c*d + e*Sin[x]), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4521

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> -Simp[(I*(e + f*x)^(m + 1))/(b*f*(m + 1)
), x] + (Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(I*a - Rt[-a^2 + b^2, 2]
 + b*E^(I*(c + d*x))), x], x] + Dist[I, Int[((e + f*x)^m*E^(I*(c + d*x)))/(
I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x))), x], x]) /; FreeQ[{a, b, c, d,
 e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d+ex^2}\,dx = \int \left(\frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}\left(a+b\sin^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx$$

$$= -\frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{-d}} - \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{-d}}$$

$$= -\frac{\text{Subst}\left(\int \frac{(a+bx)^2\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{\text{Subst}\left(\int \frac{(a+bx)^2\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}}$$

$$= -\frac{i\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{i\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \sin^{-1}(\right.}{2\sqrt{-d}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+}{}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1-\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+\frac{\sqrt{e}e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+}{}$$

Mathematica [A] time = 0.776722, size = 1101, normalized size = 1.34

$$\frac{2\sqrt{-d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)a^2 - 2b\sqrt{d}\sin^{-1}(cx)\log\left(\frac{e^{i\sin^{-1}(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)a + 2b\sqrt{d}\sin^{-1}(cx)\log\left(\frac{e^{i\sin^{-1}(cx)}\sqrt{e}}{\sqrt{dc^2+e}-ic\sqrt{-d}}+1\right)a + 2b\sqrt{d}\sin^{-}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2),x]
```

```
[Out] (2*a^2*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - 2*a*b*Sqrt[d]*ArcSin[c*x]*Log
[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] - b^2*Sq
rt[d]*ArcSin[c*x]^2*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e])] + 2*a*b*Sqrt[d]*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] + b^2*Sqrt[d]*ArcSin[c*x]^2*Log[1
+ (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] + 2*a*b*
Sqrt[d]*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqr
t[c^2*d + e])] + b^2*Sqrt[d]*ArcSin[c*x]^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - 2*a*b*Sqrt[d]*ArcSin[c*x]*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - b^2*Sqrt[d]*
ArcSin[c*x]^2*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*
d + e])] - (2*I)*b*Sqrt[d]*(a + b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + (2*I)*b*Sqrt[d]*(a + b*ArcSi
n[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*
d + e])] + (2*I)*a*b*Sqrt[d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] + Sqrt[c^2*d + e]))] + (2*I)*b^2*Sqrt[d]*ArcSin[c*x]*PolyLog[2, -(
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))] - (2*I)*a*b*
```

```
Sqrt[d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
 e])] - (2*I)*b^2*Sqrt[d]*ArcSin[c*x]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x])
)/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] + 2*b^2*Sqrt[d]*PolyLog[3, (Sqrt[e]*E^(
I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] - 2*b^2*Sqrt[d]*PolyLog[3
, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] - 2*b^2*
Sqrt[d]*PolyLog[3, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
 + e]))] + 2*b^2*Sqrt[d]*PolyLog[3, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d^2]*Sqrt[e])
```

Maple [F] time = 0.711, size = 0, normalized size = 0.

$$\int \frac{(a + b \arcsin(cx))^2}{ex^2 + d} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2 \arcsin(cx)^2 + 2\, ab \arcsin(cx) + a^2}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{d + ex^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin{(cx)} + a)^2}{ex^2 + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d), x)
```

3.664 $\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2,x\right)$$

```
[Out] Unintegrable[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Rubi [A] time = 0.0371079, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2,x]

[Out] Defer[Int][Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Mathematica [A] time = 16.879, size = 0, normalized size = 0.

$$\int \sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2,x]

[Out] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 0.379, size = 0, normalized size = 0.

$$\int \sqrt{ex^2+d}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)

[Out] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b^2 \arcsin(cx)^2 + 2\,ab \arcsin(cx) + a^2\right)\sqrt{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(e*x^2 + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int (a + b \operatorname{asin}(cx))^2 \sqrt{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**2*sqrt(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ex^2 + d}(b \arcsin(cx) + a)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)^2, x)
```

3.665 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}},x\right)$$

```
[Out] Unintegrable[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2], x]
```

Rubi [A] time = 0.0389481, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2],x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}}\,dx=\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}}\,dx$$

Mathematica [A] time = 12.1306, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2],x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2], x]
```

Maple [A] time = 0.368, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2 \arcsin(cx)^2 + 2\,ab \arcsin(cx) + a^2}{\sqrt{ex^2 + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/sqrt(e*x^2 + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{\sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/sqrt(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^2}{\sqrt{ex^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/sqrt(e*x^2 + d), x)
```

3.666 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{3/2}},x\right)$$

```
[Out] Unintegrable[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2), x]
```

Rubi [A] time = 0.043805, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2),x]

[Out] Defer[Int][(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{3/2}}\,dx=\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 3.91783, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2),x]

[Out] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2), x]
```

Maple [A] time = 0.293, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2\right)\sqrt{ex^2+d}}{e^2x^4+2dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(e*x^2 + d)/(e^2
*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\operatorname{asin}(cx))^2}{\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2)**(3/2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{(b\arcsin(cx)+a)^2}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d)^(3/2), x)
```

3.667 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{5/2}},x\right)$$

```
[Out] Unintegrable[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2), x]
```

Rubi [A] time = 0.0441763, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2),x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{5/2}}\,dx=\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 8.16982, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d+ex^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2), x]
```

Maple [A] time = 0.301, size = 0, normalized size = 0.

$$\int (a+b\arcsin(cx))^2\left(ex^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}a^2\left(\frac{2x}{\sqrt{ex^2+d}d^2}+\frac{x}{\left(ex^2+d\right)^{\frac{3}{2}}d}\right)+\int\frac{\left(b^2\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)^2+2ab\arctan\left(cx,\sqrt{cx+1}\sqrt{-cx+1}\right)\right)\sqrt{ex}}{e^3x^6+3de^2x^4+3d^2ex^2+d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a^2*(2*x/(sqrt(e*x^2 + d)*d^2) + x/((e*x^2 + d)^(3/2)*d)) + integrate((
b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)))*sqrt(e*x^2 + d)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*
x^2 + d^3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2\arcsin\left(cx\right)^2+2ab\arcsin\left(cx\right)+a^2\right)\sqrt{ex^2+d}}{e^3x^6+3de^2x^4+3d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(e*x^2 + d)/(e^3
*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(ex^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d)^(5/2), x)
```

3.668 $\int \frac{(d+ex^2)^2}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=387

$$\frac{de\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{2bc^3}-\frac{de\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{2bc^3}+\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(}{b}\right.}{8bc^5}$$

```
[Out] (d^2*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (d*e*Cos[a/b]*Cos
Integral[(a + b*ArcSin[c*x])/b])/(2*b*c^3) + (e^2*Cos[a/b]*CosIntegral[(a +
 b*ArcSin[c*x])/b])/(8*b*c^5) - (d*e*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(2*b*c^3) - (3*e^2*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin
[c*x]))/b])/(16*b*c^5) + (e^2*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x
]))/b])/(16*b*c^5) + (d^2*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b*c
) + (d*e*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(2*b*c^3) + (e^2*Sin[
a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b*c^5) - (d*e*Sin[(3*a)/b]*SinI
ntegral[(3*(a + b*ArcSin[c*x]))/b])/(2*b*c^3) - (3*e^2*Sin[(3*a)/b]*SinInte
gral[(3*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (e^2*Sin[(5*a)/b]*SinIntegral
[(5*(a + b*ArcSin[c*x]))/b])/(16*b*c^5)
```

Rubi [A] time = 0.770322, antiderivative size = 379, normalized size of antiderivative = 0.98, number of steps used = 27, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {4667, 4623, 3303, 3299, 3302, 4635, 4406}

$$\frac{de\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{2bc^3}-\frac{de\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{2bc^3}+\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\right.}{8bc^5}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*e*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/(2*b*c^3) + (e^2*Cos[a/b]*Cos
Integral[a/b + ArcSin[c*x]])/(8*b*c^5) - (d*e*Cos[(3*a)/b]*CosIntegral[(3*a
)/b + 3*ArcSin[c*x]])/(2*b*c^3) - (3*e^2*Cos[(3*a)/b]*CosIntegral[(3*a)/b +
 3*ArcSin[c*x]])/(16*b*c^5) + (e^2*Cos[(5*a)/b]*CosIntegral[(5*a)/b + 5*Arc
Sin[c*x]])/(16*b*c^5) + (d^2*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(
b*c) + (d*e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(2*b*c^3) + (e^2*Sin[a
/b]*SinIntegral[a/b + ArcSin[c*x]])/(8*b*c^5) - (d*e*Sin[(3*a)/b]*SinIntegr
al[(3*a)/b + 3*ArcSin[c*x]])/(2*b*c^3) - (3*e^2*Sin[(3*a)/b]*SinIntegral[(3
*a)/b + 3*ArcSin[c*x]])/(16*b*c^5) + (e^2*Sin[(5*a)/b]*SinIntegral[(5*a)/b
+ 5*ArcSin[c*x]])/(16*b*c^5) + (d^2*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x]
)/b])/(b*c)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
```

```
n}, x]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2}{a+b\sin^{-1}(cx)}\,dx = \int \left(\frac{d^2}{a+b\sin^{-1}(cx)}+\frac{2dex^2}{a+b\sin^{-1}(cx)}+\frac{e^2x^4}{a+b\sin^{-1}(cx)}\right)dx$$

$$= d^2\int \frac{1}{a+b\sin^{-1}(cx)}\,dx+(2de)\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx+e^2\int \frac{x^4}{a+b\sin^{-1}(cx)}\,dx$$

$$= \frac{d^2\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{bc}+\frac{(2de)\,\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{c^3}+\frac{e^2\,\text{S}}{}$$

$$= \frac{(2de)\,\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)}-\frac{\cos(3x)}{4(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{c^3}+\frac{e^2\,\text{Subst}\left(\int \left(\frac{\cos(x)}{8(a+bx)}-\frac{3\cos(3x)}{16(a+bx)}+\frac{\cos(5x)}{16(a+bx)}\right)d}{c^5}$$

$$= \frac{d^2\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{(de)\,\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2c^3}-$$

$$= \frac{d^2\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{\left(de\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\text{s}\right.}{2c^3}$$

$$= \frac{de\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{2bc^3}+\frac{e^2\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8bc^5}-\frac{de\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{2bc^3}$$

Mathematica [A] time = 0.614831, size = 253, normalized size = 0.65

$$\frac{2\cos\left(\frac{a}{b}\right)\left(8c^4d^2+4c^2de+e^2\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-e\cos\left(\frac{3a}{b}\right)\left(8c^2d+3e\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*(8*c^4*d^2 + 4*c^2*d*e + e^2)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] -
e*(8*c^2*d + 3*e)*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + e^2*Cos
[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 16*c^4*d^2*Sin[a/b]*SinInteg
ral[a/b + ArcSin[c*x]] + 8*c^2*d*e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]]
+ 2*e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - 8*c^2*d*e*Sin[(3*a)/b]*Si
nIntegral[3*(a/b + ArcSin[c*x])] - 3*e^2*Sin[(3*a)/b]*SinIntegral[3*(a/b +
ArcSin[c*x])] + e^2*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*
c^5)
```

Maple [A] time = 0.046, size = 310, normalized size = 0.8

$$\frac{1}{16c^5b}\left(16\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^4d^2+16\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^4d^2-8\,\text{Si}\left(3\arcsin(cx)+3\frac{a}{b}\right)\sin\left(3\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/16/c^5*(16*Si(arcsin(c*x)+a/b)*sin(a/b)*c^4*d^2+16*Ci(arcsin(c*x)+a/b)*co
s(a/b)*c^4*d^2-8*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*c^2*d*e-8*Ci(3*arcsin(c
*x)+3*a/b)*cos(3*a/b)*c^2*d*e+8*Si(arcsin(c*x)+a/b)*sin(a/b)*c^2*d*e+8*Ci(a
rcsin(c*x)+a/b)*cos(a/b)*c^2*d*e+sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*e^2+cos
(5*a/b)*Ci(5*arcsin(c*x)+5*a/b)*e^2-3*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*e^
2-3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*e^2+2*Si(arcsin(c*x)+a/b)*sin(a/b)*e
^2+2*Ci(arcsin(c*x)+a/b)*cos(a/b)*e^2)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2+d\right)^2}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)^2/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{e^2x^4+2\,dex^2+d^2}{b\arcsin(cx)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((e^2*x^4 + 2*d*e*x^2 + d^2)/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(d + ex^2\right)^2}{a + b \operatorname{asin}(cx)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2/(a+b*asin(c*x)),x)
```

```
[Out] Integral((d + e*x**2)**2/(a + b*asin(c*x)), x)
```

Giac [A] time = 1.39394, size = 846, normalized size = 2.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] d^2*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) - 2*d*cos(a/b)^3*cos_int
egral(3*a/b + 3*arcsin(c*x))*e/(b*c^3) - 2*d*cos(a/b)^2*e*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^2*sin(a/b)*sin_integral(a/b + arcsi
n(c*x))/(b*c) + cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))*e^2/(b*c^5)
+ cos(a/b)^4*e^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) + 3/2
*d*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))*e/(b*c^3) + 1/2*d*cos(a/b)*
cos_integral(a/b + arcsin(c*x))*e/(b*c^3) + 1/2*d*e*sin(a/b)*sin_integral(3
*a/b + 3*arcsin(c*x))/(b*c^3) + 1/2*d*e*sin(a/b)*sin_integral(a/b + arcsin(
c*x))/(b*c^3) - 5/4*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))*e^2/(b*c
^5) - 3/4*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))*e^2/(b*c^5) - 3/4*
cos(a/b)^2*e^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) - 3/4*c
os(a/b)^2*e^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^5) + 5/16*c
os(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))*e^2/(b*c^5) + 9/16*cos(a/b)*cos
_integral(3*a/b + 3*arcsin(c*x))*e^2/(b*c^5) + 1/8*cos(a/b)*cos_integral(a/
b + arcsin(c*x))*e^2/(b*c^5) + 1/16*e^2*sin(a/b)*sin_integral(5*a/b + 5*arc
sin(c*x))/(b*c^5) + 3/16*e^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(
b*c^5) + 1/8*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^5)
```

3.669 $\int \frac{d+ex^2}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=179

$$\frac{e\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4bc^3}-\frac{e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{4bc^3}+\frac{e\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4bc^3}-\frac{e\sin\left(\frac{3a}{b}\right.}{}$$

```
[Out] (d*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (e*Cos[a/b]*CosInte
gral[(a + b*ArcSin[c*x])/b])/(4*b*c^3) - (e*Cos[(3*a)/b]*CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b])/(4*b*c^3) + (d*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x
])/b])/(b*c) + (e*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b*c^3) -
(e*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b*c^3)
```

Rubi [A] time = 0.335467, antiderivative size = 175, normalized size of antiderivative = 0.98, number of steps used = 15, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4667, 4623, 3303, 3299, 3302, 4635, 4406}

$$\frac{e\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^3}-\frac{e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4bc^3}+\frac{e\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^3}-$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (e*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/(4*b*c^3) - (e*Cos[(3*a)/b]*Cos
Integral[(3*a)/b + 3*ArcSin[c*x]])/(4*b*c^3) + (d*Cos[a/b]*CosIntegral[(a +
 b*ArcSin[c*x])/b])/(b*c) + (e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*
b*c^3) - (e*Sin[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(4*b*c^3) +
(d*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b*c)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{d+ex^2}{a+b\sin^{-1}(cx)}\,dx &= \int \left(\frac{d}{a+b\sin^{-1}(cx)}+\frac{ex^2}{a+b\sin^{-1}(cx)}\right)dx\\
&= d\int \frac{1}{a+b\sin^{-1}(cx)}\,dx+e\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx\\
&= \frac{d\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{bc}+\frac{e\,\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{c^3}\\
&= \frac{e\,\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)}-\frac{\cos(3x)}{4(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{c^3}+\frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(c\right.}{bc}\\
&= \frac{d\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{e\,\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4c^3}-\frac{e\,\text{S}}{}\\
&= \frac{d\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-}\right.}{4c^3}\\
&= \frac{e\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^3}-\frac{e\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4bc^3}+\frac{d\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{e\,\text{s}}{}
\end{aligned}
$$

Mathematica [A] time = 0.267668, size = 125, normalized size = 0.7

$$
\frac{\cos\left(\frac{a}{b}\right)\left(4c^2d+e\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+4c^2d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)-e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}\right.\right.}{4bc^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] ((4*c^2*d + e)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e*Cos[(3*a)/b]*Cos
Integral[3*(a/b + ArcSin[c*x])] + 4*c^2*d*Sin[a/b]*SinIntegral[a/b + ArcSin
[c*x]] + e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - e*Sin[(3*a)/b]*SinInte
gral[3*(a/b + ArcSin[c*x])])/(4*b*c^3)
```

Maple [A] time = 0.038, size = 142, normalized size = 0.8

$$-\frac{1}{4c^3b}\left(-4\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d-4\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d+\mathrm{Si}\left(3\arcsin(cx)+3\frac{a}{b}\right)\sin\left(3\frac{a}{b}\right)e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x)),x)
```

```
[Out] -1/4/c^3*(-4*Si(arcsin(c*x)+a/b)*sin(a/b)*c^2*d-4*Ci(arcsin(c*x)+a/b)*cos(a
/b)*c^2*d+Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*e+Ci(3*arcsin(c*x)+3*a/b)*cos(
3*a/b)*e-Si(arcsin(c*x)+a/b)*sin(a/b)*e-Ci(arcsin(c*x)+a/b)*cos(a/b)*e)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{ex^2+d}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{ex^2+d}{b\arcsin(cx)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{d+ex^2}{a+b\,\mathrm{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x)),x)
```

```
[Out] Integral((d + e*x**2)/(a + b*asin(c*x)), x)
```

Giac [A] time = 1.24264, size = 317, normalized size = 1.77

$$\frac{d\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}-\frac{\cos\left(\frac{a}{b}\right)^3\mathrm{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)e}{bc^3}-\frac{\cos\left(\frac{a}{b}\right)^2e\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3}+\frac{d\,\mathrm{si}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] d*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) - cos(a/b)^3*cos_integral(
3*a/b + 3*arcsin(c*x))*e/(b*c^3) - cos(a/b)^2*e*sin(a/b)*sin_integral(3*a/b
 + 3*arcsin(c*x))/(b*c^3) + d*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c
) + 3/4*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))*e/(b*c^3) + 1/4*cos(a/
b)*cos_integral(a/b + arcsin(c*x))*e/(b*c^3) + 1/4*e*sin(a/b)*sin_integral(
3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e*sin(a/b)*sin_integral(a/b + arcsin(c
*x))/(b*c^3)
```

3.670 $\int \frac{1}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=53

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}$$

```
[Out] (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (Sin[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(b*c)
```

Rubi [A] time = 0.0634425, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4623, 3303, 3299, 3302}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^(-1),x]
```

```
[Out] (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (Sin[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(b*c)
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{1}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}$$

Mathematica [A] time = 0.0248446, size = 44, normalized size = 0.83

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^(-1),x]
```

```
[Out] (Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b + ArcSi
n[c*x]])/(b*c)
```

Maple [A] time = 0.026, size = 48, normalized size = 0.9

$$\frac{1}{c}\left(\frac{1}{b}\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\frac{1}{b}\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x)),x)
```

```
[Out] 1/c*(Si(arcsin(c*x)+a/b)*sin(a/b)/b+Ci(arcsin(c*x)+a/b)*cos(a/b)/b)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/(b*arcsin(c*x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{b\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(1/(b*arcsin(c*x) + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(a + b*asin(c*x)), x)
```

Giac [A] time = 1.32841, size = 66, normalized size = 1.25

$$\frac{\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + sin(a/b)*sin_integral(a/b
+ arcsin(c*x))/(b*c)
```

3.671 $\int \frac{1}{(d+ex^2)(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0357308, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.684052, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.523, size = 0, normalized size = 0.

$$\int \frac{1}{(ex^2+d)\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{aex^2+ad+\left(bex^2+bd\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\,\mathrm{asin}\left(cx\right)\right)\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

3.672 $\int \frac{1}{(d+ex^2)^2(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0343192, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 3.45141, size = 0, normalized size = 0.

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])),x]

[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 1.979, size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2\left(a+b\arcsin(cx)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2 (b \arcsin(cx) + a)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arcsin(cx)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*
d^2)*arcsin(c*x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.673 $\int \frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)},x\right)$$

```
[Out] Unintegrable[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]), x]
```

Rubi [A] time = 0.0421287, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]),x]
```

```
[Out] Defer[Int][Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)}\,dx = \int \frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A] time = 1.2525, size = 0, normalized size = 0.

$$\int \frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]),x]
```

```
[Out] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]), x]
```

Maple [A] time = 0.253, size = 0, normalized size = 0.

$$\int \frac{1}{a+b\arcsin(cx)}\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex^2+d}}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}}{b\arcsin(cx)+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{d+ex^2}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(d + e*x**2)/(a + b*asin(c*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex^2+d}}{b\arcsin(cx)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

3.674 $\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0439177, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 1.10146, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.235, size = 0, normalized size = 0.

$$\int \frac{1}{a+b\arcsin(cx)}\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{ex^2+d}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}}{aex^2+ad+\left(bex^2+bd\right)\arcsin(cx)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a+b\operatorname{asin}(cx))\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))*sqrt(d + e*x**2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{ex^2+d}(b\arcsin(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

3.675 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0470364, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{(d+ex^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 1.5695, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.184, size = 0, normalized size = 0.

$$\int \frac{1}{a+b\arcsin(cx)}\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^{\frac{3}{2}}\left(b \arcsin\left(cx\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{ex^2+d}}{ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*
b*d*e*x^2 + b*d^2)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b \operatorname{asin}\left(cx\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**(3/2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^{\frac{3}{2}}\left(b \arcsin\left(cx\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)), x)
```

3.676 $\int \frac{1}{(d+ex^2)^{5/2}(a+b\sin^{-1}(cx))}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi [A] time = 0.0477665, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 3.78724, size = 0, normalized size = 0.

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A] time = 0.185, size = 0, normalized size = 0.

$$\int \frac{1}{a+b\arcsin(cx)}\left(ex^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}}{ae^3x^6+3\,ade^2x^4+3\,ad^2ex^2+ad^3+\left(be^3x^6+3\,bde^2x^4+3\,bd^2ex^2+bd^3\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3
 + (b*e^3*x^6 + 3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a+b\,\mathrm{asin}\,(cx))\left(d+ex^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**(5/2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)), x)
```

3.677 $\int \frac{(d+ex^2)^2}{(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=498

$$\frac{de\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{2b^2c^3}-\frac{3de\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\sin^{-1}(cx))}{b}\right)}{2b^2c^3}+\frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right.}{8b^2c^5}$$

```
[Out] -((d^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (2*d*e*x^2*Sqrt[1 -
c^2*x^2])/(b*c*(a + b*ArcSin[c*x])) - (e^2*x^4*Sqrt[1 - c^2*x^2])/(b*c*(a +
 b*ArcSin[c*x])) + (d^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2*c
) + (d*e*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(2*b^2*c^3) + (e^2*Co
sIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b^2*c^5) - (3*d*e*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(2*b^2*c^3) - (9*e^2*CosIntegral[
(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b^2*c^5) + (5*e^2*CosIntegral[
(5*(a + b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b^2*c^5) - (d^2*Cos[a/b]*SinIn
tegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (d*e*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(2*b^2*c^3) - (e^2*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])
/b])/(8*b^2*c^5) + (3*d*e*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/
b])/(2*b^2*c^3) + (9*e^2*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(16*b^2*c^5) - (5*e^2*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(16*b^2*c^5)
```

Rubi [A] time = 0.761288, antiderivative size = 486, normalized size of antiderivative = 0.98, number of steps used = 26, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {4667, 4621, 4723, 3303, 3299, 3302, 4631}

$$\frac{de\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{2b^2c^3}-\frac{3de\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{2b^2c^3}+\frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{si}\right.}{8b^2c^5}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (2*d*e*x^2*Sqrt[1 -
c^2*x^2])/(b*c*(a + b*ArcSin[c*x])) - (e^2*x^4*Sqrt[1 - c^2*x^2])/(b*c*(a +
 b*ArcSin[c*x])) + (d^2*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(b^2*c) +
(d*e*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(2*b^2*c^3) + (e^2*CosIntegra
l[a/b + ArcSin[c*x]]*Sin[a/b])/(8*b^2*c^5) - (3*d*e*CosIntegral[(3*a)/b + 3
*ArcSin[c*x]]*Sin[(3*a)/b])/(2*b^2*c^3) - (9*e^2*CosIntegral[(3*a)/b + 3*Ar
cSin[c*x]]*Sin[(3*a)/b])/(16*b^2*c^5) + (5*e^2*CosIntegral[(5*a)/b + 5*ArcS
in[c*x]]*Sin[(5*a)/b])/(16*b^2*c^5) - (d^2*Cos[a/b]*SinIntegral[a/b + ArcSi
n[c*x]])/(b^2*c) - (d*e*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(2*b^2*c^3
) - (e^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(8*b^2*c^5) + (3*d*e*Cos[
(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(2*b^2*c^3) + (9*e^2*Cos[(3*
a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[c*x]])/(16*b^2*c^5) - (5*e^2*Cos[(5*a)
/b]*SinIntegral[(5*a)/b + 5*ArcSin[c*x]])/(16*b^2*c^5)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
```

tQ[p, 0] || IGtQ[n, 0])

Rule 4621

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + Dist[c/(b*(n + 1)),
 Int[(x*(a + b*ArcSin[c*x])^(n + 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4631

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^m*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] - Dist
[1/(b*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[(a + b*x)^(n + 1), Sin
[x]^(m - 1)*(m - (m + 1)*Sin[x]^2), x], x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{(d+ex^2)^2}{(a+b\sin^{-1}(cx))^2}\,dx = \int \left(\frac{d^2}{(a+b\sin^{-1}(cx))^2}+\frac{2dex^2}{(a+b\sin^{-1}(cx))^2}+\frac{e^2x^4}{(a+b\sin^{-1}(cx))^2}\right)dx$$

$$= d^2\int \frac{1}{(a+b\sin^{-1}(cx))^2}\,dx + (2de)\int \frac{x^2}{(a+b\sin^{-1}(cx))^2}\,dx + e^2\int \frac{x^4}{(a+b\sin^{-1}(cx))^2}\,dx$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{(cd^2)\int \frac{x}{\sqrt{1-c^2x^2}(a+b\sin^{-1}(c}}{b}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{d^2\,\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x,}{bc}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \right.}{bc}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{d^2\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin}{b^2c}$$

Mathematica [A] time = 2.081, size = 359, normalized size = 0.72

$$-\frac{-2\sin\left(\frac{a}{b}\right)\left(8c^4d^2+4c^2de+e^2\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+3e\sin\left(\frac{3a}{b}\right)\left(8c^2d+3e\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\sin^{-1}(cx)\right)\right)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((16*b*c^4*d^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (32*b*c^4*d*e*x^2*
Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (16*b*c^4*e^2*x^4*Sqrt[1 - c^2*x^2
])/(a + b*ArcSin[c*x]) - 2*(8*c^4*d^2 + 4*c^2*d*e + e^2)*CosIntegral[a/b +
ArcSin[c*x]]*Sin[a/b] + 3*e*(8*c^2*d + 3*e)*CosIntegral[3*(a/b + ArcSin[c*x
])]*Sin[(3*a)/b] - 5*e^2*CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] +
16*c^4*d^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 8*c^2*d*e*Cos[a/b]*Sin
Integral[a/b + ArcSin[c*x]] + 2*e^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]]
 - 24*c^2*d*e*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 9*e^2*Cos[(
3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*e^2*Cos[(5*a)/b]*SinIntegral
[5*(a/b + ArcSin[c*x])])/(16*b^2*c^5)
```

Maple [A] time = 0.092, size = 795, normalized size = 1.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] -1/16/c^5*(5*Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a*e^2-5*Ci(5*arcsin(c*x)+5*
a/b)*sin(5*a/b)*a*e^2-9*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*e^2+9*Ci(3*arc
sin(c*x)+3*a/b)*sin(3*a/b)*a*e^2+2*Si(arcsin(c*x)+a/b)*cos(a/b)*a*e^2-2*Ci(
arcsin(c*x)+a/b)*sin(a/b)*a*e^2+16*(-c^2*x^2+1)^(1/2)*b*c^4*d^2+cos(5*arcsi
```

```
n(c*x))*b*e^2+24*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a*c^2*d*e-3*cos(3*arcsi
n(c*x))*b*e^2+2*(-c^2*x^2+1)^(1/2)*b*e^2-8*cos(3*arcsin(c*x))*b*c^2*d*e+16*
Si(arcsin(c*x)+a/b)*cos(a/b)*a*c^4*d^2-16*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^
4*d^2+8*(-c^2*x^2+1)^(1/2)*b*c^2*d*e+5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*
cos(5*a/b)*b*e^2-5*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b*e^2-9*a
rcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*e^2+9*arcsin(c*x)*Ci(3*arcs
in(c*x)+3*a/b)*sin(3*a/b)*b*e^2+2*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*
b*e^2-2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*e^2+16*arcsin(c*x)*Si(ar
csin(c*x)+a/b)*cos(a/b)*b*c^4*d^2-16*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/
b)*b*c^4*d^2-24*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*c^2*d*e-24*arcsin(c*x)
*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*c^2*d*e+24*arcsin(c*x)*Ci(3*arcsin(c*
x)+3*a/b)*sin(3*a/b)*b*c^2*d*e+8*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b
*c^2*d*e-8*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d*e+8*Si(arcsin(c
*x)+a/b)*cos(a/b)*a*c^2*d*e-8*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^2*d*e)/(a+b*
arcsin(c*x))/b^2
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{e^2x^4 + 2\,dex^2 + d^2}{b^2\arcsin\left(cx\right)^2 + 2\,ab\arcsin\left(cx\right) + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((e^2*x^4 + 2*d*e*x^2 + d^2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x)
 + a^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(d + ex^2\right)^2}{\left(a + b\,\text{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((d + e*x**2)**2/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.67164, size = 3137, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b*c^4*d^2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arc
sin(c*x) + a*b^2*c^5) - 6*b*c^2*d*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b
 + 3*arcsin(c*x))*e*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 6*b*c^2*d*
arcsin(c*x)*cos(a/b)^3*e*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsi
n(c*x) + a*b^2*c^5) - b*c^4*d^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arc
sin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + a*c^4*d^2*cos_integral(a/b +
arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5*b*arcsin(c*x)*c
os(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(
c*x) + a*b^2*c^5) - 6*a*c^2*d*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x)
)*e*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 5*b*arcsin(c*x)*cos(a/b)^5
*e^2*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
+ 6*a*c^2*d*cos(a/b)^3*e*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsi
n(c*x) + a*b^2*c^5) - a*c^4*d^2*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b
^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5*a*cos(a/b)^4*cos_integral(5*a/b + 5*arc
sin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 3/2*b*c^2*d*arcs
in(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*e*sin(a/b)/(b^3*c^5*arcsin(c*x)
 + a*b^2*c^5) + 1/2*b*c^2*d*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*e*s
in(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 5*a*cos(a/b)^5*e^2*sin_integral
(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/2*b*c^2*d*arc
sin(c*x)*cos(a/b)*e*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x
) + a*b^2*c^5) - 1/2*b*c^2*d*arcsin(c*x)*cos(a/b)*e*sin_integral(a/b + arcs
in(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - sqrt(-c^2*x^2 + 1)*b*c^4*d^2/(
b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 15/4*b*arcsin(c*x)*cos(a/b)^2*cos_integr
al(5*a/b + 5*arcsin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) -
9/4*b*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*e^2*sin(a/
b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 3/2*a*c^2*d*cos_integral(3*a/b + 3*a
rcsin(c*x))*e*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 1/2*a*c^2*d*cos_
integral(a/b + arcsin(c*x))*e*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) +
25/4*b*arcsin(c*x)*cos(a/b)^3*e^2*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*
c^5*arcsin(c*x) + a*b^2*c^5) + 9/4*b*arcsin(c*x)*cos(a/b)^3*e^2*sin_integra
l(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/2*a*c^2*d*co
s(a/b)*e*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c
^5) - 1/2*a*c^2*d*cos(a/b)*e*sin_integral(a/b + arcsin(c*x))/(b^3*c^5*arcsi
n(c*x) + a*b^2*c^5) + 2*(-c^2*x^2 + 1)^(3/2)*b*c^2*d*e/(b^3*c^5*arcsin(c*x)
 + a*b^2*c^5) - 15/4*a*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*e^2*s
in(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/4*a*cos(a/b)^2*cos_integral(3
*a/b + 3*arcsin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 25/4
*a*cos(a/b)^3*e^2*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x)
+ a*b^2*c^5) + 9/4*a*cos(a/b)^3*e^2*sin_integral(3*a/b + 3*arcsin(c*x))/(b^
3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*sqrt(-c^2*x^2 + 1)*b*c^2*d*e/(b^3*c^5*ar
csin(c*x) + a*b^2*c^5) + 5/16*b*arcsin(c*x)*cos_integral(5*a/b + 5*arcsin(c
*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/16*b*arcsin(c*x)*co
s_integral(3*a/b + 3*arcsin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2
*c^5) + 1/8*b*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*e^2*sin(a/b)/(b^3
*c^5*arcsin(c*x) + a*b^2*c^5) - 25/16*b*arcsin(c*x)*cos(a/b)*e^2*sin_integr
al(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 27/16*b*arcsi
n(c*x)*cos(a/b)*e^2*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x
) + a*b^2*c^5) - 1/8*b*arcsin(c*x)*cos(a/b)*e^2*sin_integral(a/b + arcsin(c
*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - (c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)
*b*e^2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5/16*a*cos_integral(5*a/b + 5*ar
csin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/16*a*cos_inte
```

```
gral(3*a/b + 3*arcsin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
+ 1/8*a*cos_integral(a/b + arcsin(c*x))*e^2*sin(a/b)/(b^3*c^5*arcsin(c*x) +
 a*b^2*c^5) - 25/16*a*cos(a/b)*e^2*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3
*c^5*arcsin(c*x) + a*b^2*c^5) - 27/16*a*cos(a/b)*e^2*sin_integral(3*a/b + 3
*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 1/8*a*cos(a/b)*e^2*sin_in
tegral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 2*(-c^2*x^2 +
 1)^(3/2)*b*e^2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - sqrt(-c^2*x^2 + 1)*b*e^
2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
```

3.678 $\int \frac{d+ex^2}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=249

$$\frac{e\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b^2c^3}-\frac{3e\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3\left(a+b\sin^{-1}(cx)\right)}{b}\right)}{4b^2c^3}-\frac{e\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{4b^2c^3}+\frac{3e\cos\left(\frac{3a}{b}\right.}{}$$

```
[Out] -((d*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (e*x^2*Sqrt[1 - c^2*x^
2])/(b*c*(a + b*ArcSin[c*x])) + (d*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a
/b])/(b^2*c) + (e*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b^2*c^3)
- (3*e*CosIntegral[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b^2*c^3) - (
d*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (e*Cos[a/b]*SinInt
egral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^3) + (3*e*Cos[(3*a)/b]*SinIntegral[(
3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^3)
```

Rubi [A] time = 0.418202, antiderivative size = 241, normalized size of antiderivative = 0.97, number of steps used = 15, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4667, 4621, 4723, 3303, 3299, 3302, 4631}

$$\frac{e\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^3}-\frac{3e\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4b^2c^3}-\frac{e\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^3}+\frac{3e}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (e*x^2*Sqrt[1 - c^2*x^
2])/(b*c*(a + b*ArcSin[c*x])) + (d*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])
/(b^2*c) + (e*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b])/(4*b^2*c^3) - (3*e*C
osIntegral[(3*a)/b + 3*ArcSin[c*x]]*Sin[(3*a)/b])/(4*b^2*c^3) - (d*Cos[a/b]
*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c) - (e*Cos[a/b]*SinIntegral[a/b + Ar
cSin[c*x]])/(4*b^2*c^3) + (3*e*Cos[(3*a)/b]*SinIntegral[(3*a)/b + 3*ArcSin[
c*x]])/(4*b^2*c^3)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4621

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + Dist[c/(b*(n + 1)),
 Int[(x*(a + b*ArcSin[c*x])^(n + 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
```

```
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4631

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^m*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] - Dist
[1/(b*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[(a + b*x)^(n + 1), Sin
[x]^(m - 1)*(m - (m + 1)*Sin[x]^2), x], x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{d+ex^2}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \left(\frac{d}{\left(a+b\sin^{-1}(cx)\right)^2}+\frac{ex^2}{\left(a+b\sin^{-1}(cx)\right)^2}\right)dx$$

$$= d\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx + e\int \frac{x^2}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{(cd)\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx}{b} + \frac{e\,\mathrm{Subst}\left(\int \left(\right.\right.}{}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{d\,\mathrm{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc} - \frac{e\,\mathrm{Subs}}{}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx\right.}{bc}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{d\mathrm{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b^2c} + \frac{e\mathrm{Ci}\left(\frac{a}{b}+\sin^{-1}\right.}{4b}$$

Mathematica [A] time = 0.94263, size = 191, normalized size = 0.77

$$-\frac{-\sin\left(\frac{a}{b}\right)\left(4c^2d+e\right)\mathrm{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+4c^2d\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)+\frac{4bc^2d\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}+\frac{4bc^2ex^2\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}+3}{4b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((4*b*c^2*d*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (4*b*c^2*e*x^2*Sqrt[1
 - c^2*x^2])/(a + b*ArcSin[c*x]) - (4*c^2*d + e)*CosIntegral[a/b + ArcSin[c
*x]]*Sin[a/b] + 3*e*CosIntegral[3*(a/b + ArcSin[c*x])]*Sin[(3*a)/b] + 4*c^2
*d*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + e*Cos[a/b]*SinIntegral[a/b + A
rcSin[c*x]] - 3*e*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(4*b^2*c
^3)
```

Maple [A] time = 0.071, size = 367, normalized size = 1.5

$$\frac{1}{4c^3(a+b\arcsin(cx))b^2}\left(-4\arcsin(cx)\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)bc^2d+4\arcsin(cx)\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/4/c^3*(-4*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*c^2*d+4*arcsin(c*x)*
Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d-4*Si(arcsin(c*x)+a/b)*cos(a/b)*a*c^2*d
+4*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^2*d+3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/
b)*cos(3*a/b)*b*e-3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b*e-arcs
in(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*e+arcsin(c*x)*Ci(arcsin(c*x)+a/b)*si
n(a/b)*b*e-4*(-c^2*x^2+1)^(1/2)*b*c^2*d+3*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b
)*a*e-3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a*e-Si(arcsin(c*x)+a/b)*cos(a/b)
*a*e+Ci(arcsin(c*x)+a/b)*sin(a/b)*a*e-(-c^2*x^2+1)^(1/2)*b*e+cos(3*arcsin(c
*x))*b*e)/(a+b*arcsin(c*x))/b^2
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{ex^2+d}{b^2\arcsin(cx)^2+2ab\arcsin(cx)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((e*x^2 + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{d+ex^2}{(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((d + e*x**2)/(a + b*asin(c*x))**2, x)
```

Giac [B] time = 1.49064, size = 1222, normalized size = 4.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b*c^2*d*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) - 3*b*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b + 3*arc
sin(c*x))*e*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 3*b*arcsin(c*x)*co
s(a/b)^3*e*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2
*c^3) - b*c^2*d*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) + a*c^2*d*cos_integral(a/b + arcsin(c*x))*sin(a
/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3*a*cos(a/b)^2*cos_integral(3*a/b +
 3*arcsin(c*x))*e*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 3*a*cos(a/b)
^3*e*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
 - a*c^2*d*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a
*b^2*c^3) + 3/4*b*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*e*sin(a/b
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*arcsin(c*x)*cos_integral(a/b +
arcsin(c*x))*e*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*b*arcsin(c*
x)*cos(a/b)*e*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*
b^2*c^3) - 1/4*b*arcsin(c*x)*cos(a/b)*e*sin_integral(a/b + arcsin(c*x))/(b^
3*c^3*arcsin(c*x) + a*b^2*c^3) - sqrt(-c^2*x^2 + 1)*b*c^2*d/(b^3*c^3*arcsin
(c*x) + a*b^2*c^3) + 3/4*a*cos_integral(3*a/b + 3*arcsin(c*x))*e*sin(a/b)/(
b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*a*cos_integral(a/b + arcsin(c*x))*e*
sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*a*cos(a/b)*e*sin_integral(
3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/4*a*cos(a/b)*e
*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + (-c^2*
x^2 + 1)^(3/2)*b*e/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - sqrt(-c^2*x^2 + 1)*b
*e/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

3.679 $\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=86

$$\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)}$$

```
[Out] -(Sqrt[1 - c^2*x^2]/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(a + b*ArcSin
[c*x])/b]*Sin[a/b])/(b^2*c) - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])
/(b^2*c)
```

Rubi [A] time = 0.16764, antiderivative size = 82, normalized size of antiderivative = 0.95, number of steps used = 5, number of rules used = 5, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4621, 4723, 3303, 3299, 3302}

$$\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^(-2),x]
```

```
[Out] -(Sqrt[1 - c^2*x^2]/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[a/b + ArcSin[
c*x]]*Sin[a/b])/(b^2*c) - (Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c)
```

Rule 4621

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + Dist[c/(b*(n + 1)),
 Int[(x*(a + b*ArcSin[c*x])^(n + 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3303

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[(c*f)/d + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[(c*f)/d + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rubi steps

$$\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{c\int \frac{x}{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}\,dx}{b}$$

$$= -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos}{a}\right.}{b}$$

$$= -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b^2c} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b^2c}$$

Mathematica [A] time = 0.163086, size = 72, normalized size = 0.84

$$\frac{-\frac{b\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)} + \sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\sin^{-1}(cx)\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^(-2),x]
```

```
[Out] (-((b*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + CosIntegral[a/b + ArcSin[c*
x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c)
```

Maple [A] time = 0., size = 76, normalized size = 0.9

$$\frac{1}{c}\left(-\frac{1}{(a+b\arcsin(cx))\,b}\sqrt{-c^2x^2+1} - \frac{1}{b^2}\left(\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right) - \text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))^2,x)
```

```
[Out] 1/c*(-(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))/b-(Si(arcsin(c*x)+a/b)*cos(a/b)-
Ci(arcsin(c*x)+a/b)*sin(a/b))/b^2)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(a+b\,\text{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**(-2), x)
```

Giac [B] time = 1.30513, size = 259, normalized size = 3.01

$$\frac{b\arcsin(cx)\,\text{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c}-\frac{b\arcsin(cx)\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c}+\frac{a\,\text{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) +
 a*b^2*c) - b*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) + a*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*a
rcsin(c*x) + a*b^2*c) - a*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) - sqrt(-c^2*x^2 + 1)*b/(b^3*c*arcsin(c*x) + a*b^2*c)
```

3.680 $\int \frac{1}{(d+ex^2)(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.0340797, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2),x]

[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 20.5259, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.688, size = 0, normalized size = 0.

$$\int \frac{1}{(ex^2+d)\left(a+b\arcsin(cx)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{a^2ex^2 + a^2d + \left(b^2ex^2 + b^2d\right)\arcsin\left(cx\right)^2 + 2\left(abex^2 + abd\right)\arcsin\left(cx\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arcsin(c*x)^2 + 2*(a*b*
e*x^2 + a*b*d)*arcsin(c*x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2 + d\right)\left(b\arcsin\left(cx\right) + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^2), x)
```

3.681 $\int \frac{1}{(d+ex^2)^2 (a+b\sin^{-1}(cx))^2} dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)^2 (a+b\sin^{-1}(cx))^2}, x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.0327086, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)^2 (a+b\sin^{-1}(cx))^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^2 (a+b\sin^{-1}(cx))^2} dx = \int \frac{1}{(d+ex^2)^2 (a+b\sin^{-1}(cx))^2} dx$$

Mathematica [A] time = 49.753, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)^2 (a+b\sin^{-1}(cx))^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 2.052, size = 0, normalized size = 0.

$$\int \frac{1}{(ex^2+d)^2 (a+b\arcsin(cx))^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{a^2e^2x^4 + 2\,a^2dex^2 + a^2d^2 + \left(b^2e^2x^4 + 2\,b^2dex^2 + b^2d^2\right)\arcsin\left(cx\right)^2 + 2\left(abe^2x^4 + 2\,abdex^2 + abd^2\right)\arcsin\left(cx\right)},\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*
e*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*
arcsin(c*x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.682 $\int \frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2, x]
```

Rubi [A] time = 0.040308, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 6.87117, size = 0, normalized size = 0.

$$\int \frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2, x]
```

Maple [A] time = 0.261, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\arcsin(cx)\right)^2}\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}}{b^2\arcsin\left(cx\right)^2+2\,ab\arcsin\left(cx\right)+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{d+ex^2}}{\left(a+b\,\text{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d + e*x**2)/(a + b*asin(c*x))**2, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{ex^2+d}}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a)^2, x)
```

3.683 $\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.0407799, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 11.1927, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{d+ex^2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.242, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\arcsin(cx)\right)^2}\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}}{a^2ex^2+a^2d+\left(b^2ex^2+b^2d\right)\arcsin\left(cx\right)^2+2\left(abex^2+abd\right)\arcsin\left(cx\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arcsin(c*
x)^2 + 2*(a*b*e*x^2 + a*b*d)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(a+b\operatorname{asin}\left(cx\right)\right)^2\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**2*sqrt(d + e*x**2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{ex^2+d}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)^2), x)
```

3.684 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))^2},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.0443735, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A] time = 25.0262, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.187, size = 0, normalized size = 0.

$$\int \frac{1}{(a+b\arcsin(cx))^2}\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}}{a^2e^2x^4+2\,a^2dex^2+a^2d^2+\left(b^2e^2x^4+2\,b^2dex^2+b^2d^2\right)\arcsin\left(cx\right)^2+2\left(abe^2x^4+2\,abdex^2+abd^2\right)\arcsin\left(cx\right)},\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*
x^4 + 2*b^2*d*e*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x
^2 + a*b*d^2)*arcsin(c*x)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\,\text{asin}\left(cx\right)\right)^2\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x**2)**(3/2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

3.685 $\int \frac{1}{(d+ex^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [A] time = 0.0432489, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A] time = 48.4118, size = 0, normalized size = 0.

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A] time = 0.185, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\arcsin(cx)\right)^2}\left(ex^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}}{a^2e^3x^6+3\,a^2de^2x^4+3\,a^2d^2ex^2+a^2d^3+\left(b^2e^3x^6+3\,b^2de^2x^4+3\,b^2d^2ex^2+b^2d^3\right)\arcsin\left(cx\right)^2+2\left(abe^3x^6+3\,a\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)/(a^2*e^3*x^6 + 3*a^2*d*e^2*x^4 + 3*a^2*d^2*e*x^2 +
 a^2*d^3 + (b^2*e^3*x^6 + 3*b^2*d*e^2*x^4 + 3*b^2*d^2*e*x^2 + b^2*d^3)*arcs
in(c*x)^2 + 2*(a*b*e^3*x^6 + 3*a*b*d*e^2*x^4 + 3*a*b*d^2*e*x^2 + a*b*d^3)*a
rcsin(c*x)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

3.686 $\int \left(d+ex^2\right)^2 \sqrt{a+b\sin^{-1}(cx)}\, dx$

Optimal. Leaf size=754

result too large to display

```
[Out] d^2*x*Sqrt[a + b*ArcSin[c*x]] + (2*d*e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 + (e^
2*x^5*Sqrt[a + b*ArcSin[c*x]])/5 - (Sqrt[b]*d^2*Sqrt[Pi/2]*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c - (Sqrt[b]*d*e*Sqrt[Pi/2
]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c^3)
- (Sqrt[b]*e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(8*c^5) + (Sqrt[b]*d*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sq
rt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(6*c^3) + (Sqrt[b]*e^2*Sqrt[Pi/
6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16
*c^5) - (Sqrt[b]*e^2*Sqrt[Pi/10]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(80*c^5) + (Sqrt[b]*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sqrt[b]*d*e*Sqrt[
Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c
^3) + (Sqrt[b]*e^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])
/Sqrt[b]]*Sin[a/b])/(8*c^5) - (Sqrt[b]*d*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*
Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(6*c^3) - (Sqrt[b]*e^2*Sqrt
[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])
/(16*c^5) + (Sqrt[b]*e^2*Sqrt[Pi/10]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(80*c^5)
```

Rubi [A] time = 2.26488, antiderivative size = 754, normalized size of antiderivative = 1., number of steps used = 42, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4667, 4619, 4723, 3306, 3305, 3351, 3304, 3352, 4629, 3312}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}de\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2c^3}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{b}de\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{6c^3}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}de\cos\left(\frac{a}{b}\right)S\left(\cdots\right.}{2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]],x]
```


```
[Out] d^2*x*Sqrt[a + b*ArcSin[c*x]] + (2*d*e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 + (e^
2*x^5*Sqrt[a + b*ArcSin[c*x]])/5 - (Sqrt[b]*d^2*Sqrt[Pi/2]*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c - (Sqrt[b]*d*e*Sqrt[Pi/2
]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c^3)
- (Sqrt[b]*e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(8*c^5) + (Sqrt[b]*d*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sq
rt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(6*c^3) + (Sqrt[b]*e^2*Sqrt[Pi/
6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16
*c^5) - (Sqrt[b]*e^2*Sqrt[Pi/10]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(80*c^5) + (Sqrt[b]*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sqrt[b]*d*e*Sqrt[
Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c
^3) + (Sqrt[b]*e^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])
/Sqrt[b]]*Sin[a/b])/(8*c^5) - (Sqrt[b]*d*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*
Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(6*c^3) - (Sqrt[b]*e^2*Sqrt
[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])
/(16*c^5) + (Sqrt[b]*e^2*Sqrt[Pi/10]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(80*c^5)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rubi steps

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\sin^{-1}(cx)}\,dx = \int \left(d^2\sqrt{a+b\sin^{-1}(cx)}+2dex^2\sqrt{a+b\sin^{-1}(cx)}+e^2x^4\sqrt{a+b\sin^{-1}(cx)}\right)dx$$

$$= d^2\int \sqrt{a+b\sin^{-1}(cx)}\,dx+(2de)\int x^2\sqrt{a+b\sin^{-1}(cx)}\,dx+e^2\int x^4\sqrt{a+b\sin^{-1}$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\sin^{-1}(cx)}-\frac{1}{2}\left(bcd\right.$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\sin^{-1}(cx)}-\frac{\left(bd^2\right)}{}$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\sin^{-1}(cx)}-\frac{(bde)}{}$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\sin^{-1}(cx)}+\frac{(bde)}{}$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}d^2}{}$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}d^2}{}$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}d^2}{}$$

Mathematica [C] time = 1.56011, size = 400, normalized size = 0.53

$$be^{-\frac{5ia}{b}}\left(450e^{\frac{4ia}{b}}\left(8c^4d^2+4c^2de+e^2\right)\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\,\text{Gamma}\left(\frac{3}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+450e^{\frac{6ia}{b}}\left(8c^4d^2+4c^2de+e^2\right)\sqrt{\frac{i(a}{}}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (b*(450*(8*c^4*d^2 + 4*c^2*d*e + e^2)*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*Arc
Sin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 450*(8*c^4*d^2 + 4
*c^2*d*e + e^2)*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2,
(I*(a + b*ArcSin[c*x]))/b] - e*(25*Sqrt[3]*(8*c^2*d + 3*e)*E^(((2*I)*a)/b)*
Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x]))/
b] + 25*Sqrt[3]*(8*c^2*d + 3*e)*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x])
)/b]*Gamma[3/2, ((3*I)*(a + b*ArcSin[c*x]))/b] - 9*Sqrt[5]*e*(Sqrt[((-I)*(a
 + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] + E^(((10*
I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((5*I)*(a + b*ArcSin[c*
x]))/b]))))/(7200*c^5*E^(((5*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.159, size = 1137, normalized size = 1.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] -1/7200/c^5*(-200*2^(1/2)*(1/b)^(1/2)*cos(3*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*
3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*3^(1/2)*(a+b*arcsin
(c*x))^(1/2)*b*c^2*d*e+200*2^(1/2)*(1/b)^(1/2)*sin(3*a/b)*FresnelC(2^(1/2)/
Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*3^(1/2)*(a
+b*arcsin(c*x))^(1/2)*b*c^2*d*e-75*2^(1/2)*(1/b)^(1/2)*cos(3*a/b)*FresnelS(
2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*3^
(1/2)*(a+b*arcsin(c*x))^(1/2)*b*e^2+75*2^(1/2)*(1/b)^(1/2)*sin(3*a/b)*Fresn
elC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2
)*3^(1/2)*(a+b*arcsin(c*x))^(1/2)*b*e^2+1200*arcsin(c*x)*sin(3*(a+b*arcsin(
c*x))/b-3*a/b)*b*c^2*d*e+1200*sin(3*(a+b*arcsin(c*x))/b-3*a/b)*a*c^2*d*e+45
0*arcsin(c*x)*sin(3*(a+b*arcsin(c*x))/b-3*a/b)*b*e^2+450*sin(3*(a+b*arcsin(
c*x))/b-3*a/b)*a*e^2+3600*2^(1/2)*(1/b)^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^
(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/
2)*b*c^4*d^2-3600*2^(1/2)*(1/b)^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*b*c^4
*d^2+1800*2^(1/2)*(1/b)^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*b*c^2*d*e-180
0*2^(1/2)*(1/b)^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*a
rcsin(c*x))^(1/2)/b)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*b*c^2*d*e-7200*arcsin
(c*x)*sin((a+b*arcsin(c*x))/b-a/b)*b*c^4*d^2+450*2^(1/2)*(1/b)^(1/2)*cos(a/
b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2
)*(a+b*arcsin(c*x))^(1/2)*b*e^2-450*2^(1/2)*(1/b)^(1/2)*sin(a/b)*FresnelC(2
^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*(a+b*arcsin
(c*x))^(1/2)*b*e^2-7200*sin((a+b*arcsin(c*x))/b-a/b)*a*c^4*d^2-3600*arcsin(
c*x)*sin((a+b*arcsin(c*x))/b-a/b)*b*c^2*d*e-3600*sin((a+b*arcsin(c*x))/b-a/
b)*a*c^2*d*e-900*arcsin(c*x)*sin((a+b*arcsin(c*x))/b-a/b)*b*e^2-900*sin((a+
b*arcsin(c*x))/b-a/b)*a*e^2-9*5^(1/2)*2^(1/2)*(1/b)^(1/2)*FresnelC(2^(1/2)/
Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*sin(5*a/b)*Pi^(1/2)
*(a+b*arcsin(c*x))^(1/2)*b*e^2+9*5^(1/2)*2^(1/2)*(1/b)^(1/2)*cos(5*a/b)*Fre
snelS(2^(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1
/2)*(a+b*arcsin(c*x))^(1/2)*b*e^2-90*arcsin(c*x)*sin(5*(a+b*arcsin(c*x))/b-
5*a/b)*b*e^2-90*sin(5*(a+b*arcsin(c*x))/b-5*a/b)*a*e^2)/(a+b*arcsin(c*x))^(
1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2 + d\right)^2 \sqrt{b \arcsin\left(cx\right) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)^2*sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + b \operatorname{asin}(cx)} \left(d + ex^2\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))*(d + e*x**2)**2, x)
```

Giac [C] time = 3.21901, size = 1751, normalized size = 2.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*I*sqrt(2)*sqrt(pi)*b^2*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/s
qrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)
/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - 1/4*I*sqrt(2)*sqrt(pi)*b^2*d^2
*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(
b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqr
t(abs(b)))*c) - 1/2*I*sqrt(b*arcsin(c*x) + a)*d^2*e^(I*arcsin(c*x))/c + 1/2
*I*sqrt(b*arcsin(c*x) + a)*d^2*e^(-I*arcsin(c*x))/c + 1/8*I*sqrt(2)*sqrt(pi
)*b^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(
2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b + 1)/((I*b^2/sqrt(abs(b
)) + b*sqrt(abs(b)))*c^3) - 1/8*I*sqrt(2)*sqrt(pi)*b^2*d*erf(1/2*I*sqrt(2)*
sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*
sqrt(abs(b))/b)*e^(-I*a/b + 1)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c^3)
 - 1/12*I*sqrt(pi)*b^(3/2)*d*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(
b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b + 1)/
((sqrt(6)*b + I*sqrt(6)*b^2/abs(b))*c^3) + 1/12*I*sqrt(pi)*b^(3/2)*d*erf(-1
/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*
x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b + 1)/((sqrt(6)*b - I*sqrt(6)*b^2/abs(b)
)*c^3) + 1/12*I*sqrt(b*arcsin(c*x) + a)*d*e^(3*I*arcsin(c*x) + 1)/c^3 - 1/4
*I*sqrt(b*arcsin(c*x) + a)*d*e^(I*arcsin(c*x) + 1)/c^3 + 1/4*I*sqrt(b*arcsi
n(c*x) + a)*d*e^(-I*arcsin(c*x) + 1)/c^3 - 1/12*I*sqrt(b*arcsin(c*x) + a)*d
*e^(-3*I*arcsin(c*x) + 1)/c^3 + 1/32*I*sqrt(2)*sqrt(pi)*b^2*erf(-1/2*I*sqrt
(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
 a)*sqrt(abs(b))/b)*e^(I*a/b + 2)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c^
5) - 1/32*I*sqrt(2)*sqrt(pi)*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/
sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/
```

```
b + 2)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c^5) + 1/160*I*sqrt(pi)*b^(3
/2)*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(10)*sqrt
(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(5*I*a/b + 2)/((sqrt(10)*b + I*sqrt(1
0)*b^2/abs(b))*c^5) - 1/32*I*sqrt(pi)*b^(3/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsi
n(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))
*e^(3*I*a/b + 2)/((sqrt(6)*b + I*sqrt(6)*b^2/abs(b))*c^5) + 1/32*I*sqrt(pi)
*b^(3/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*s
qrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b + 2)/((sqrt(6)*b - I*sqr
t(6)*b^2/abs(b))*c^5) - 1/160*I*sqrt(pi)*b^(3/2)*erf(-1/2*sqrt(10)*sqrt(b*a
rcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/ab
s(b))*e^(-5*I*a/b + 2)/((sqrt(10)*b - I*sqrt(10)*b^2/abs(b))*c^5) - 1/160*I
*sqrt(b*arcsin(c*x) + a)*e^(5*I*arcsin(c*x) + 2)/c^5 + 1/32*I*sqrt(b*arcsin
(c*x) + a)*e^(3*I*arcsin(c*x) + 2)/c^5 - 1/16*I*sqrt(b*arcsin(c*x) + a)*e^(
I*arcsin(c*x) + 2)/c^5 + 1/16*I*sqrt(b*arcsin(c*x) + a)*e^(-I*arcsin(c*x) +
 2)/c^5 - 1/32*I*sqrt(b*arcsin(c*x) + a)*e^(-3*I*arcsin(c*x) + 2)/c^5 + 1/1
60*I*sqrt(b*arcsin(c*x) + a)*e^(-5*I*arcsin(c*x) + 2)/c^5
```

3.687 $\int \left(d+ex^2\right)\sqrt{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=369

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{4c^3}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{12c^3}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e\cos\left(\frac{a}{b}\right)S\left(\sqrt{\frac{2}{\pi}}\right.}{4c^3}$$

```
[Out] d*x*Sqrt[a + b*ArcSin[c*x]] + (e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 - (Sqrt[b]*
d*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]
])/c - (Sqrt[b]*e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]])/(4*c^3) + (Sqrt[b]*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(S
qrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(12*c^3) + (Sqrt[b]*d*Sqrt[Pi/
2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sq
rt[b]*e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*S
in[a/b])/(4*c^3) - (Sqrt[b]*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(12*c^3)
```

Rubi [A] time = 1.02657, antiderivative size = 369, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4667, 4619, 4723, 3306, 3305, 3351, 3304, 3352, 4629, 3312}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{4c^3}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{12c^3}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e\cos\left(\frac{a}{b}\right)S\left(\sqrt{\frac{2}{\pi}}\right.}{4c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*Sqrt[a + b*ArcSin[c*x]],x]
```


```
[Out] d*x*Sqrt[a + b*ArcSin[c*x]] + (e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 - (Sqrt[b]*
d*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]
])/c - (Sqrt[b]*e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]])/(4*c^3) + (Sqrt[b]*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(S
qrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(12*c^3) + (Sqrt[b]*d*Sqrt[Pi/
2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sq
rt[b]*e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*S
in[a/b])/(4*c^3) - (Sqrt[b]*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(12*c^3)
```


Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rubi steps

$$\int \left(d+ex^2\right)\sqrt{a+b\sin^{-1}(cx)}\,dx = \int \left(d\sqrt{a+b\sin^{-1}(cx)}+ex^2\sqrt{a+b\sin^{-1}(cx)}\right)dx$$

$$= d\int \sqrt{a+b\sin^{-1}(cx)}\,dx + e\int x^2\sqrt{a+b\sin^{-1}(cx)}\,dx$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{1}{2}(bcd)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(c}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{(bd)\,\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx\right.}{2c}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{(be)\,\text{Subst}\left(\int \left(\frac{3\sin(x)}{4\sqrt{a+bx}}-\frac{\sin(3x)}{4\sqrt{a+bx}}\right)dx\right.}{6c^3}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{(be)\,\text{Subst}\left(\int \frac{\sin(3x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx\right.}{24c^3}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right.}{c}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right.}{c}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right.}{c}$$

Mathematica [C] time = 0.613829, size = 244, normalized size = 0.66

$$\frac{be^{-\frac{3ia}{b}}\left(9e^{\frac{2ia}{b}}\left(4c^2d+e\right)\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{3}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+9e^{\frac{4ia}{b}}\left(4c^2d+e\right)\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{3}{2},\frac{i(a}{}\right.\right.}{72c^3\sqrt{a+}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (b*(9*(4*c^2*d + e)*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamm
a[3/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 9*(4*c^2*d + e)*E^(((4*I)*a)/b)*Sqrt
[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]
*e*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x
]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((3*I)*
(a + b*ArcSin[c*x]))/b])))/(72*c^3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.112, size = 542, normalized size = 1.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] 1/72/c^3*(-36*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)
*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d+3
6*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^
(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d+3^(1/2)*(1/b)
^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(2^(1/2)
/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e-3^(1/2)*(1/b)^
(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*FresnelC(2^(1/2)/
Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e-9*(1/b)^(1/2)*P
i^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/
(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e+9*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(
a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*
arcsin(c*x))^(1/2)/b)*b*e+72*arcsin(c*x)*sin((a+b*arcsin(c*x))/b-a/b)*b*c^2
*d+72*sin((a+b*arcsin(c*x))/b-a/b)*a*c^2*d+18*arcsin(c*x)*sin((a+b*arcsin(c
*x))/b-a/b)*b*e-6*arcsin(c*x)*sin(3*(a+b*arcsin(c*x))/b-3*a/b)*b*e+18*sin((
a+b*arcsin(c*x))/b-a/b)*a*e-6*sin(3*(a+b*arcsin(c*x))/b-3*a/b)*a*e)/(a+b*ar
csin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2+d\right)\sqrt{b\arcsin\left(cx\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)*sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+b\operatorname{asin}\left(cx\right)}\left(d+ex^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))*(d + e*x**2), x)
```

Giac [C] time = 2.38412, size = 865, normalized size = 2.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*I*sqrt(2)*sqrt(pi)*b^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(
(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - 1/4*I*sqrt(2)*sqrt(pi)*b^2*d*erf
(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(ab
s(b)))*c) - 1/2*I*sqrt(b*arcsin(c*x) + a)*d*e^(I*arcsin(c*x))/c + 1/2*I*sqr
t(b*arcsin(c*x) + a)*d*e^(-I*arcsin(c*x))/c + 1/16*I*sqrt(2)*sqrt(pi)*b^2*e
rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b + 1)/((I*b^2/sqrt(abs(b)) + b*sq
rt(abs(b)))*c^3) - 1/16*I*sqrt(2)*sqrt(pi)*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arc
sin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b
))/b)*e^(-I*a/b + 1)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c^3) - 1/24*I*
sqrt(pi)*b^(3/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*s
qrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b + 1)/((sqrt(6)*b
+ I*sqrt(6)*b^2/abs(b))*c^3) + 1/24*I*sqrt(pi)*b^(3/2)*erf(-1/2*sqrt(6)*sqr
t(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b
)/abs(b))*e^(-3*I*a/b + 1)/((sqrt(6)*b - I*sqrt(6)*b^2/abs(b))*c^3) + 1/24*
I*sqrt(b*arcsin(c*x) + a)*e^(3*I*arcsin(c*x) + 1)/c^3 - 1/8*I*sqrt(b*arcsin
(c*x) + a)*e^(I*arcsin(c*x) + 1)/c^3 + 1/8*I*sqrt(b*arcsin(c*x) + a)*e^(-I*
arcsin(c*x) + 1)/c^3 - 1/24*I*sqrt(b*arcsin(c*x) + a)*e^(-3*I*arcsin(c*x) +
 1)/c^3
```

3.688 $\int \sqrt{a+b\sin^{-1}(cx)}\,dx$

Optimal. Leaf size=120

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{c}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{c}+x\sqrt{a+b\sin^{-1}(cx)}$$

```
[Out] x*Sqrt[a + b*ArcSin[c*x]] - (Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/P
i]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqr
t[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c
```

Rubi [A] time = 0.270951, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4619, 4723, 3306, 3305, 3351, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{c}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{c}+x\sqrt{a+b\sin^{-1}(cx)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b*ArcSin[c*x]],x]
```


```
[Out] x*Sqrt[a + b*ArcSin[c*x]] - (Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/P
i]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqr
t[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c
```


Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\begin{aligned}\int \sqrt{a+b\sin^{-1}(cx)}\,dx &= x\sqrt{a+b\sin^{-1}(cx)}-\frac{1}{2}(bc)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx\\ &= x\sqrt{a+b\sin^{-1}(cx)}-\frac{b\,\mathrm{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{2c}\\ &= x\sqrt{a+b\sin^{-1}(cx)}-\frac{\left(b\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{2c}+\frac{\left(b\sin\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int\right.}{}\\ &= x\sqrt{a+b\sin^{-1}(cx)}-\frac{\cos\left(\frac{a}{b}\right)\mathrm{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\sin^{-1}(cx)}\right)}{c}+\frac{\sin\left(\frac{a}{b}\right)\mathrm{Subst}\left(\int\right.}{}\\ &= x\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{c}+\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right.}{c}\end{aligned}$$

Mathematica [C] time = 0.0926495, size = 119, normalized size = 0.99

$$\frac{be^{-\frac{ia}{b}}\left(\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\,\mathrm{Gamma}\left(\frac{3}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\,\mathrm{Gamma}\left(\frac{3}{2},\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\right)}{2c\sqrt{a+b\sin^{-1}(cx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (b*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x])
)/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a + b
*ArcSin[c*x]))/b]))/(2*c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.001, size = 178, normalized size = 1.5

$$\frac{1}{2\,c}\left(-\sqrt{2}\sqrt{\pi}\sqrt{b^{-1}}\sqrt{a+b\arcsin(cx)}\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}}{\sqrt{\pi}b}\sqrt{a+b\arcsin(cx)}\frac{1}{\sqrt{b^{-1}}}\right)b+\sqrt{2}\sqrt{\pi}\sqrt{b^{-1}}\sqrt{a+b\arcsin\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] 1/2/c/(a+b*arcsin(c*x))^(1/2)*(-2^(1/2)*Pi^(1/2)*(1/b)^(1/2)*(a+b*arcsin(c*
x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b)*b+2^(1/2)*Pi^(1/2)*(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*Fr
esnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b+2*arcsin(c
*x)*sin((a+b*arcsin(c*x))/b-a/b)*b+2*sin((a+b*arcsin(c*x))/b-a/b)*a)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b \arcsin(cx) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + b \operatorname{asin}(cx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x)), x)
```

Giac [C] time = 1.50831, size = 266, normalized size = 2.22

$$\frac{i\sqrt{2}\sqrt{\pi}b\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4c\left(\frac{ib}{\sqrt{|b|}}+\sqrt{|b|}\right)}-\frac{i\sqrt{2}\sqrt{\pi}b\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4c\left(-\frac{ib}{\sqrt{|b|}}+\sqrt{|b|}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*I*sqrt(2)*sqrt(pi)*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(ab
s(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I
*b/sqrt(abs(b)) + sqrt(abs(b)))) - 1/4*I*sqrt(2)*sqrt(pi)*b*erf(1/2*I*sqrt(
2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
a)*sqrt(abs(b))/b)*e^(-I*a/b)/(c*(-I*b/sqrt(abs(b)) + sqrt(abs(b)))) - 1/2*
I*sqrt(b*arcsin(c*x) + a)*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(c*x) +
a)*e^(-I*arcsin(c*x))/c
```

3.689 $\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2},x\right)$$

```
[Out] Unintegrable[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2), x]
```

Rubi [A] time = 0.0529863, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2),x]
```

```
[Out] Defer[Int][Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2), x]
```

Rubi steps

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2}\,dx = \int \frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2}\,dx$$

Mathematica [A] time = 9.96503, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2),x]
```

```
[Out] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2), x]
```

Maple [A] time = 0.202, size = 0, normalized size = 0.

$$\int \frac{1}{ex^2+d}\sqrt{a+b\arcsin(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
```

```
[Out] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b \operatorname{asin}(cx)}}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(1/2)/(e*x**2+d),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b \arcsin(cx) + a}}{ex^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

3.690 $\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2},x\right)$$

```
[Out] Unintegrable[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2, x]
```

Rubi [A] time = 0.0488776, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2,x]
```

```
[Out] Defer[Int][Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2}\,dx = \int \frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2}\,dx$$

Mathematica [A] time = 21.2521, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2,x]
```

```
[Out] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2, x]
```

Maple [A] time = 0.501, size = 0, normalized size = 0.

$$\int \frac{1}{(ex^2+d)^2}\sqrt{a+b\arcsin(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
```

```
[Out] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b \arcsin(cx) + a}}{\left(ex^2 + d\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(e*x^2 + d)^2, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b \operatorname{asin}(cx)}}{\left(d + ex^2\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(1/2)/(e*x**2+d)**2,x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.691 $\int \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)^{3/2}\,dx$

Optimal. Leaf size=482

$$-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8c^3}+\frac{\sqrt{\frac{\pi}{6}}b^{3/2}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{24c^3}-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e\sin\left(\frac{a}{b}\right)S\left(\ldots\right.}{8c^3}$$

```
[Out] (3*b*d*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + (b*e*Sqrt[1 - c^2
*x^2]*Sqrt[a + b*ArcSin[c*x]])/(3*c^3) + (b*e*x^2*Sqrt[1 - c^2*x^2]*Sqrt[a
+ b*ArcSin[c*x]])/(6*c) + d*x*(a + b*ArcSin[c*x])^(3/2) + (e*x^3*(a + b*Arc
Sin[c*x])^(3/2))/3 - (3*b^(3/2)*d*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*
Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*Cos[a/b]
*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*c^3) + (b^(3/2)
*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sq
rt[b]])/(24*c^3) - (3*b^(3/2)*d*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*FresnelS[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(8*c^3) + (b^(3/2)*e
*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a
)/b])/(24*c^3)
```

Rubi [A] time = 1.42438, antiderivative size = 482, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 13, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.65, Rules used = {4667, 4619, 4677, 4623, 3306, 3305, 3351, 3304, 3352, 4629, 4707, 4635, 4406}

$$-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8c^3}+\frac{\sqrt{\frac{\pi}{6}}b^{3/2}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{24c^3}-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e\sin\left(\frac{a}{b}\right)S\left(\ldots\right.}{8c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (3*b*d*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + (b*e*Sqrt[1 - c^2
*x^2]*Sqrt[a + b*ArcSin[c*x]])/(3*c^3) + (b*e*x^2*Sqrt[1 - c^2*x^2]*Sqrt[a
+ b*ArcSin[c*x]])/(6*c) + d*x*(a + b*ArcSin[c*x])^(3/2) + (e*x^3*(a + b*Arc
Sin[c*x])^(3/2))/3 - (3*b^(3/2)*d*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*
Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*Cos[a/b]
*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*c^3) + (b^(3/2)
*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sq
rt[b]])/(24*c^3) - (3*b^(3/2)*d*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*FresnelS[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(8*c^3) + (b^(3/2)*e
*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a
)/b])/(24*c^3)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4629

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^(m + 1)*(a + b*ArcSin[c*x])^n)/(m + 1), x] - Dist[(b*c*n)/(m + 1), Int[(x
^(m + 1)*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4707

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
```

```
ArcSin[c*x])^n)/(e*m), x] + (Dist[(f^2*(m - 1))/(c^2*m), Int[((f*x)^(m - 2)
*(a + b*ArcSin[c*x])^n)/Sqrt[d + e*x^2], x], x] + Dist[(b*f*n*Sqrt[1 - c^2*
x^2])/(c*m*Sqrt[d + e*x^2]), Int[(f*x)^(m - 1)*(a + b*ArcSin[c*x])^(n - 1),
 x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
&& GtQ[m, 1] && IntegerQ[m]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)^{3/2}\,dx = \int \left(d\left(a+b\sin^{-1}(cx)\right)^{3/2}+ex^2\left(a+b\sin^{-1}(cx)\right)^{3/2}\right)dx$$

$$= d\int \left(a+b\sin^{-1}(cx)\right)^{3/2}\,dx + e\int x^2\left(a+b\sin^{-1}(cx)\right)^{3/2}\,dx$$

$$= dx\left(a+b\sin^{-1}(cx)\right)^{3/2}+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{1}{2}(3bcd)\int \frac{x\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{1-c^2x^2}}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{6c}+dx\left(a+b\sin^{-1}\right.$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{3c^3}+\frac{bex^2\sqrt{1-c^2x^2}\sqrt{}}{6c}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{3c^3}+\frac{bex^2\sqrt{1-c^2x^2}\sqrt{}}{6c}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{3c^3}+\frac{bex^2\sqrt{1-c^2x^2}\sqrt{}}{6c}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{3c^3}+\frac{bex^2\sqrt{1-c^2x^2}\sqrt{}}{6c}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{3c^3}+\frac{bex^2\sqrt{1-c^2x^2}\sqrt{}}{6c}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{3c^3}+\frac{bex^2\sqrt{1-c^2x^2}\sqrt{}}{6c}$$

Mathematica [C] time = 10.1017, size = 873, normalized size = 1.81

$$\frac{abde^{-\frac{ia}{b}}\left(\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{3}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{3}{2},\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\right)}{2c\sqrt{a+b\sin^{-1}(cx)}}+\frac{abee^{-\frac{3ia}{b}}\left(9\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (a*b*d*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c
*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a
 + b*ArcSin[c*x]))/b]))/(2*c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]]) + (a*b*e*
(9*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a +
 b*ArcSin[c*x]))/b] + 9*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gam
ma[3/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*(Sqrt[((-I)*(a + b*ArcSin[c*x]
))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*
(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((3*I)*(a + b*ArcSin[c*x]))/b])))/(72*c^
3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]]) + (b*d*(2*Sqrt[a + b*ArcSin[c*x]
]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) - Sqrt[b^(-1)]*Sqrt[2*Pi]*Fresn
elC[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(3*b*Cos[a/b] + 2*a*Si
n[a/b]) + Sqrt[b^(-1)]*Sqrt[2*Pi]*FresnelS[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c*x]]]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*c) + (b*e*(18*Sqrt[a +
b*ArcSin[c*x]]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) - 9*Sqrt[b^(-1)]*S
qrt[2*Pi]*FresnelC[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(3*b*Co
s[a/b] + 2*a*Sin[a/b]) + 9*Sqrt[b^(-1)]*Sqrt[2*Pi]*FresnelS[Sqrt[b^(-1)]*Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(2*a*Cos[a/b] - 3*b*Sin[a/b]) + Sqrt[b^(-
1)]*Sqrt[6*Pi]*FresnelC[Sqrt[b^(-1)]*Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(b
*Cos[(3*a)/b] + 2*a*Sin[(3*a)/b]) + Sqrt[b^(-1)]*Sqrt[6*Pi]*FresnelS[Sqrt[b
^(-1)]*Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(-2*a*Cos[(3*a)/b] + b*Sin[(3*a)
/b]) - 6*Sqrt[a + b*ArcSin[c*x]]*(Cos[3*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[3*
ArcSin[c*x]])))/(144*c^3)
```

Maple [B] time = 0.154, size = 835, normalized size = 1.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] 1/144/c^3*(-108*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/
b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b^2*c^2
*d-108*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*Fresne
lS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b^2*c^2*d+(1/b)^
(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelC(2^(1/2)/
Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*3^(1/2)*b^2*e+(1/b)
^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*FresnelS(2^(1/2)
/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*3^(1/2)*b^2*e-27*(
1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelC(2^(1/
2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b^2*e-27*(1/b)^(1/2)*Pi^
(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b^2*e+144*arcsin(c*x)^2*sin((a+b*arcsi
n(c*x))/b-a/b)*b^2*c^2*d+288*arcsin(c*x)*sin((a+b*arcsin(c*x))/b-a/b)*a*b*c
^2*d+216*arcsin(c*x)*cos((a+b*arcsin(c*x))/b-a/b)*b^2*c^2*d+36*arcsin(c*x)^
```

```
2*sin((a+b*arcsin(c*x))/b-a/b)*b^2*e-12*arcsin(c*x)^2*sin(3*(a+b*arcsin(c*x
))/b-3*a/b)*b^2*e+144*sin((a+b*arcsin(c*x))/b-a/b)*a^2*c^2*d+216*cos((a+b*a
rcsin(c*x))/b-a/b)*a*b*c^2*d+72*arcsin(c*x)*sin((a+b*arcsin(c*x))/b-a/b)*a*
b*e+54*arcsin(c*x)*cos((a+b*arcsin(c*x))/b-a/b)*b^2*e-24*arcsin(c*x)*sin(3*
(a+b*arcsin(c*x))/b-3*a/b)*a*b*e-6*arcsin(c*x)*cos(3*(a+b*arcsin(c*x))/b-3*
a/b)*b^2*e+36*sin((a+b*arcsin(c*x))/b-a/b)*a^2*e+54*cos((a+b*arcsin(c*x))/b
-a/b)*a*b*e-12*sin(3*(a+b*arcsin(c*x))/b-3*a/b)*a^2*e-6*cos(3*(a+b*arcsin(c
*x))/b-3*a/b)*a*b*e)/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2+d\right)(b \arcsin(cx)+a)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a+b\,\mathrm{asin}(cx))^{\frac{3}{2}}\left(d+ex^2\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**(3/2)*(d + e*x**2), x)
```

Giac [C] time = 3.82275, size = 2699, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] -1/4*I*sqrt(2)*sqrt(pi)*a*b^3*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/
sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b
```

```
)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 3/8*sqrt(2)*sqrt(pi)*b^4*d*
erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(
b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqr
t(abs(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*a*b^3*d*erf(1/2*I*sqrt(2)*sqrt(b*arc
sin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b
))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 3/8*sqrt(2)
*sqrt(pi)*b^4*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(
abs(b)) + b^2*sqrt(abs(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*a*b^2*d*erf(-1/2*I*
sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*
x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c)
 - 1/4*I*sqrt(2)*sqrt(pi)*a*b^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a
/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - 1/2*I*sqrt(b*arcsin(c*x) +
 a)*b*d*arcsin(c*x)*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(c*x) + a)*b*d
*arcsin(c*x)*e^(-I*arcsin(c*x))/c - 1/16*I*sqrt(2)*sqrt(pi)*a*b^3*erf(-1/2*
I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(
c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b + 1)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs
(b)))*c^3) + 3/32*sqrt(2)*sqrt(pi)*b^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x
) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e
^(I*a/b + 1)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) + 1/16*I*sqrt(2)
*sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b + 1)/((-I*b^3/s
qrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) + 3/32*sqrt(2)*sqrt(pi)*b^4*erf(1/2*I*
sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*
x) + a)*sqrt(abs(b))/b)*e^(-I*a/b + 1)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs
(b)))*c^3) - 1/2*I*sqrt(b*arcsin(c*x) + a)*a*d*e^(I*arcsin(c*x))/c + 3/4*sq
rt(b*arcsin(c*x) + a)*b*d*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(c*x) +
a)*a*d*e^(-I*arcsin(c*x))/c + 3/4*sqrt(b*arcsin(c*x) + a)*b*d*e^(-I*arcsin(
c*x))/c + 1/24*I*sqrt(pi)*a*b^(5/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a
)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/
b + 1)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*c^3) - 1/48*sqrt(pi)*b^(7/2)*e
rf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcs
in(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b + 1)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/
abs(b))*c^3) + 1/16*I*sqrt(2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcs
in(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b)
)/b)*e^(I*a/b + 1)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c^3) - 1/16*I*sqr
t(2)*sqrt(pi)*a*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b + 1)/((-I*b
^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c^3) - 1/24*I*sqrt(pi)*a*b^(5/2)*erf(-1/2
*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x)
 + a)*sqrt(b)/abs(b))*e^(-3*I*a/b + 1)/((sqrt(6)*b^2 - I*sqrt(6)*b^3/abs(b)
)*c^3) - 1/48*sqrt(pi)*b^(7/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqr
t(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b +
1)/((sqrt(6)*b^2 - I*sqrt(6)*b^3/abs(b))*c^3) - 1/24*I*sqrt(pi)*a*b^(3/2)*e
rf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcs
in(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b + 1)/((sqrt(6)*b + I*sqrt(6)*b^2/ab
s(b))*c^3) + 1/24*I*sqrt(pi)*a*b^(3/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x)
+ a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*
I*a/b + 1)/((sqrt(6)*b - I*sqrt(6)*b^2/abs(b))*c^3) + 1/24*I*sqrt(b*arcsin(
c*x) + a)*b*arcsin(c*x)*e^(3*I*arcsin(c*x) + 1)/c^3 - 1/8*I*sqrt(b*arcsin(c
*x) + a)*b*arcsin(c*x)*e^(I*arcsin(c*x) + 1)/c^3 + 1/8*I*sqrt(b*arcsin(c*x)
 + a)*b*arcsin(c*x)*e^(-I*arcsin(c*x) + 1)/c^3 - 1/24*I*sqrt(b*arcsin(c*x)
+ a)*b*arcsin(c*x)*e^(-3*I*arcsin(c*x) + 1)/c^3 + 1/24*I*sqrt(b*arcsin(c*x)
 + a)*a*e^(3*I*arcsin(c*x) + 1)/c^3 - 1/48*sqrt(b*arcsin(c*x) + a)*b*e^(3*I
*arcsin(c*x) + 1)/c^3 - 1/8*I*sqrt(b*arcsin(c*x) + a)*a*e^(I*arcsin(c*x) +
1)/c^3 + 3/16*sqrt(b*arcsin(c*x) + a)*b*e^(I*arcsin(c*x) + 1)/c^3 + 1/8*I*s
qrt(b*arcsin(c*x) + a)*a*e^(-I*arcsin(c*x) + 1)/c^3 + 3/16*sqrt(b*arcsin(c*
x) + a)*b*e^(-I*arcsin(c*x) + 1)/c^3 - 1/24*I*sqrt(b*arcsin(c*x) + a)*a*e^(
```

```
-3*I*arcsin(c*x) + 1)/c^3 - 1/48*sqrt(b*arcsin(c*x) + a)*b*e^(-3*I*arcsin(c
*x) + 1)/c^3
```

3.692 $\int \left(a+b\sin^{-1}(cx)\right)^{3/2}\,dx$

Optimal. Leaf size=159

$$-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2c}-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2c}+\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx}}{2c}$$

```
[Out] (3*b*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + x*(a + b*ArcSin[c*x
])^(3/2) - (3*b^(3/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*S
qrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c)
```

Rubi [A] time = 0.232287, antiderivative size = 159, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4619, 4677, 4623, 3306, 3305, 3351, 3304, 3352}

$$-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2c}-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2c}+\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx}}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (3*b*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + x*(a + b*ArcSin[c*x
])^(3/2) - (3*b^(3/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*S
qrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c)
```

Rule 4619

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[(x*(a + b*ArcSin[c*x])^(n - 1))/Sqrt[1 -
 c^2*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4677

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[((d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n)/(2*e*(p +
 1)), x] + Dist[(b*n*d^IntPart[p]*(d + e*x^2)^FracPart[p])/(2*c*(p + 1)*(1
- c^2*x^2)^FracPart[p]), Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n
 - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n
, 0] && NeQ[p, -1]
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
```

```
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$
\begin{aligned}
\int \left(a+b\sin^{-1}(cx)\right)^{3/2}\,dx &= x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{1}{2}(3bc)\int \frac{x\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{1-c^2x^2}}\,dx\\
&= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{1}{4}\left(3b^2\right)\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx\\
&= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{(3b)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\text{si}\right.}{4c}\\
&= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a\right.}{4c}\\
&= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx,x\right.}{2c}\\
&= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right.}{2c}
\end{aligned}
$$

Mathematica [C] time = 2.74216, size = 291, normalized size = 1.83

$$
\frac{b\left(\frac{2ae^{-\frac{ia}{b}}\left(\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{3}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{3}{2},\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\right)}{\sqrt{a+b\sin^{-1}(cx)}}+2\left(3\sqrt{1-c^2x^2}+2cx\sin^{-1}(cx)\right)\sqrt{\right.}{}
$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (b*(2*Sqrt[a + b*ArcSin[c*x]]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) + (
2*a*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x]
))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a +
b*ArcSin[c*x]))/b]))/(E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]]) - Sqrt[b^(-1)]*S
qrt[2*Pi]*FresnelC[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(3*b*Co
s[a/b] + 2*a*Sin[a/b]) + Sqrt[b^(-1)]*Sqrt[2*Pi]*FresnelS[Sqrt[b^(-1)]*Sqrt
[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*c)
```

Maple [B] time = 0., size = 270, normalized size = 1.7

$$\frac{1}{4c}\left(-3\sqrt{b^{-1}}\sqrt{\pi}\sqrt{a+b\arcsin(cx)}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{b^{-1}}\sqrt{\pi}b}\right)\sqrt{2}b^2-3\sqrt{b^{-1}}\sqrt{\pi}\sqrt{a+b\arcsin(cx)}\,\mathrm{si}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] 1/4/c/(a+b*arcsin(c*x))^(1/2)*(-3*(1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1
/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b)*2^(1/2)*b^2-3*(1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*Fres
nelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*b^2+4*
arcsin(c*x)^2*sin((a+b*arcsin(c*x))/b-a/b)*b^2+8*arcsin(c*x)*sin((a+b*arcsi
n(c*x))/b-a/b)*a*b+6*arcsin(c*x)*cos((a+b*arcsin(c*x))/b-a/b)*b^2+4*sin((a+
b*arcsin(c*x))/b-a/b)*a^2+6*cos((a+b*arcsin(c*x))/b-a/b)*a*b)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (b\arcsin(cx)+a)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b\operatorname{asin}(cx))^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**(3/2), x)
```

Giac [C] time = 2.18128, size = 879, normalized size = 5.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] -1/4*I*sqrt(2)*sqrt(pi)*a*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sq
rt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/
((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 3/8*sqrt(2)*sqrt(pi)*b^4*erf(
-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(ab
s(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*
x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*
e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 3/8*sqrt(2)*sqrt(
pi)*b^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2
)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b))
+ b^2*sqrt(abs(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqrt(2)*sq
rt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sq
rt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - 1/4*I*s
qrt(2)*sqrt(pi)*a*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)
) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2
/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - 1/2*I*sqrt(b*arcsin(c*x) + a)*b*arcsin
(c*x)*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(c*x) + a)*b*arcsin(c*x)*e^(
-I*arcsin(c*x))/c - 1/2*I*sqrt(b*arcsin(c*x) + a)*a*e^(I*arcsin(c*x))/c + 3
/4*sqrt(b*arcsin(c*x) + a)*b*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(c*x)
 + a)*a*e^(-I*arcsin(c*x))/c + 3/4*sqrt(b*arcsin(c*x) + a)*b*e^(-I*arcsin(c
*x))/c
```

3.693 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2},x\right)$$

```
[Out] Unintegrable[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2), x]
```

Rubi [A] time = 0.0619877, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2),x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2), x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2}\,dx=\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2}\,dx$$

Mathematica [A] time = 3.38365, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2), x]
```

Maple [A] time = 0.204, size = 0, normalized size = 0.

$$\int \frac{1}{ex^2+d}\left(a+b\arcsin(cx)\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
```

```
[Out] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\,\mathrm{asin}\,(cx))^{\frac{3}{2}}}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(3/2)/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))**(3/2)/(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\arcsin\,(cx)+a)^{\frac{3}{2}}}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(e*x^2 + d), x)
```

3.694 $\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{\left(d+ex^2\right)^2},x\right)$$

```
[Out] Unintegrable[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2, x]
```

Rubi [A] time = 0.0587861, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2,x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{\left(d+ex^2\right)^2}\,dx=\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{\left(d+ex^2\right)^2}\,dx$$

Mathematica [A] time = 11.3023, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2,x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2, x]
```

Maple [A] time = 0.562, size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2}\left(a+b\arcsin(cx)\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
```

```
[Out] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \arcsin(cx) + a)^{\frac{3}{2}}}{(ex^2 + d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(e*x^2 + d)^2, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(3/2)/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.695 $\int \frac{(d+ex^2)^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx$

Optimal. Leaf size=679

$$\frac{\sqrt{\frac{\pi}{2}}de\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3}-\frac{\sqrt{\frac{\pi}{6}}de\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3}+\frac{\sqrt{\frac{\pi}{2}}de\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\,s}}{\sqrt{b}}\right.}{\sqrt{b}c^3}$$

```
[Out] (d*e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt
[b]])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*Cos[a/b]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (d*e*Sqrt
[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])
/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Cos[(5*a)
/b]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5
) + (d*e*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*
Sin[a/b])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*c) - (d*e*
Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)
/b])/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Fresn
elS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(8*Sqrt[b]
*c^5)
```

Rubi [A] time = 1.50435, antiderivative size = 679, normalized size of antiderivative = 1., number of steps used = 39, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4667, 4623, 3306, 3305, 3351, 3304, 3352, 4635, 4406}

$$\frac{\sqrt{\frac{\pi}{2}}de\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3}-\frac{\sqrt{\frac{\pi}{6}}de\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3}+\frac{\sqrt{\frac{\pi}{2}}de\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\,s}}{\sqrt{b}}\right.}{\sqrt{b}c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (d*e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt
[b]])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*Cos[a/b]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (d*e*Sqrt
[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])
/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Cos[(5*a)
/b]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5
) + (d*e*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*
Sin[a/b])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*c) - (d*e*
Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)
/b])/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Fresn
elS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(8*Sqrt[b]
```

```
*c^5)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx = \int \left(\frac{d^2}{\sqrt{a+b\sin^{-1}(cx)}}+\frac{2dex^2}{\sqrt{a+b\sin^{-1}(cx)}}+\frac{e^2x^4}{\sqrt{a+b\sin^{-1}(cx)}}\right)dx$$

$$= d^2\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx+(2de)\int \frac{x^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx+e^2\int \frac{x^4}{\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

$$= \frac{d^2\,\mathrm{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\sin^{-1}(cx)\right)}{bc}+\frac{(2de)\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{(2de)\,\mathrm{Subst}\left(\int \left(\frac{\cos(x)}{4\sqrt{a+bx}}-\frac{\cos(3x)}{4\sqrt{a+bx}}\right)dx,x,\sin^{-1}(cx)\right)}{c^3}+\frac{e^2\,\mathrm{Subst}\left(\int \left(\frac{\cos(x)}{8\sqrt{a+bx}}-\frac{3\cos(3x)}{16\sqrt{a+bx}}+\frac{\cos}{16\sqrt{}}\right.\right.}{c^5}$$

$$= \frac{(de)\,\mathrm{Subst}\left(\int \frac{\cos(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{2c^3}-\frac{(de)\,\mathrm{Subst}\left(\int \frac{\cos(3x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{2c^3}+\frac{e^2\,\mathrm{Subst}\left(\right.}{}$$

$$= \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}+\frac{d^2\sqrt{2\pi}S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c}+\frac{\left(de\cos\left(\frac{a}{b}\right)\right)\mathrm{Sul}}{}$$

$$= \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}+\frac{d^2\sqrt{2\pi}S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c}+\frac{\left(de\cos\left(\frac{a}{b}\right)\right)\mathrm{Sul}}{}$$

$$= \frac{de\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3}+\frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{4\sqrt{b}c^5}+\frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C}{}$$

Mathematica [C] time = 1.5743, size = 401, normalized size = 0.59

$$\frac{ie^{-\frac{5ia}{b}}\left(-30e^{\frac{4ia}{b}}\left(8c^4d^2+4c^2de+e^2\right)\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\mathrm{Gamma}\left(\frac{1}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+30e^{\frac{6ia}{b}}\left(8c^4d^2+4c^2de+e^2\right)\sqrt{\frac{i(a+b}{}}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)^2/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((I/480)*(-30*(8*c^4*d^2 + 4*c^2*d*e + e^2)*E^(((4*I)*a)/b)*Sqrt[((-I)*(a +
 b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 30*(8*c^4*d^
2 + 4*c^2*d*e + e^2)*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[
1/2, (I*(a + b*ArcSin[c*x]))/b] + e*(5*Sqrt[3]*(8*c^2*d + 3*e)*E^(((2*I)*a)
/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x
]))/b] - 5*Sqrt[3]*(8*c^2*d + 3*e)*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*
x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[5]*e*(Sqrt[((-I)
*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - E^(((
10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((5*I)*(a + b*ArcSin
[c*x]))/b]))))/(c^5*E^(((5*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.101, size = 545, normalized size = 0.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] -1/240/c^5*(1/b)^(1/2)*Pi^(1/2)*2^(1/2)*5^(1/2)*(-48*5^(1/2)*cos(a/b)*Fresn
elC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^4*d^2-48*5^(1
/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b)*c^4*d^2+8*5^(1/2)*3^(1/2)*cos(3*a/b)*FresnelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(
1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^2*d*e+8*5^(1/2)*3^(1/2)*sin(3*a/b)*
FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^
2*d*e-24*5^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin
(c*x))^(1/2)/b)*c^2*d*e-24*5^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)
^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^2*d*e+3*5^(1/2)*3^(1/2)*cos(3*a/b)*Fres
nelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2+3*
5^(1/2)*3^(1/2)*sin(3*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a
+b*arcsin(c*x))^(1/2)/b)*e^2-6*5^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(
1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2-6*5^(1/2)*sin(a/b)*FresnelS(2^(1/
2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2-3*cos(5*a/b)*Fresnel
C(2^(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2-3*sin
(5*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*5^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/
2)/b)*e^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2 + d\right)^2}{\sqrt{b \arcsin\left(cx\right) + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)^2/sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(d + ex^2\right)^2}{\sqrt{a + b \operatorname{asin}\left(cx\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral((d + e*x**2)**2/sqrt(a + b*asin(c*x)), x)
```

Giac [C] time = 3.08554, size = 1314, normalized size = 1.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/
sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*d^2*erf(1/2*I*sqrt(2)*sqrt
(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt
(abs(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))
)) + 1/2*sqrt(pi)*d*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*
I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b + 1)/((sqrt(6)
*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b))*c^3) - 1/2*sqrt(pi)*d*erf(-1/2*I*sqrt(
2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
a)*sqrt(abs(b))/b)*e^(I*a/b + 1)/(c^3*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*s
qrt(abs(b)))) - 1/2*sqrt(pi)*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sq
rt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b
+ 1)/(c^3*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/2*sqrt(pi
)*d*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b
*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b + 1)/((sqrt(6)*sqrt(b) - I*sq
rt(6)*b^(3/2)/abs(b))*c^3) - 1/16*sqrt(pi)*erf(-1/2*sqrt(10)*sqrt(b*arcsin(
c*x) + a)/sqrt(b) - 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*
e^(5*I*a/b + 2)/((sqrt(10)*sqrt(b) + I*sqrt(10)*b^(3/2)/abs(b))*c^5) - 1/8*
sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b + 2)/(c^5*(I*sqrt(2)*b
/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/8*sqrt(pi)*erf(1/2*I*sqrt(2)*sqr
t(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqr
t(abs(b))/b)*e^(-I*a/b + 2)/(c^5*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(
abs(b)))) - 1/16*sqrt(pi)*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b)
 + 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-5*I*a/b + 2)/
((sqrt(10)*sqrt(b) - I*sqrt(10)*b^(3/2)/abs(b))*c^5) + 3/16*sqrt(pi)*erf(-1
/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*
x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b + 2)/(sqrt(b)*c^5*(sqrt(6) + I*sqrt(6)*b
/abs(b))) + 3/16*sqrt(pi)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b)
+ 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b + 2)/(s
qrt(b)*c^5*(sqrt(6) - I*sqrt(6)*b/abs(b)))
```

3.696 $\int \frac{d+ex^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx$

Optimal. Leaf size=329

$$\frac{\sqrt{\frac{\pi}{2}}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}-\frac{\sqrt{\frac{\pi}{6}}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}+\frac{\sqrt{\frac{\pi}{2}}e\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}$$

```
[Out] (e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b
]])/(2*Sqrt[b]*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC
[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*Sqrt[b]*c^3) + (e*Sqrt[P
i/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*Sq
rt[b]*c^3) + (d*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sq
rt[b]]*Sin[a/b])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(2*Sqrt[b]*c^3)
```

Rubi [A] time = 0.637046, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.45, Rules used = {4667, 4623, 3306, 3305, 3351, 3304, 3352, 4635, 4406}

$$\frac{\sqrt{\frac{\pi}{2}}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}-\frac{\sqrt{\frac{\pi}{6}}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}+\frac{\sqrt{\frac{\pi}{2}}e\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b
]])/(2*Sqrt[b]*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC
[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*Sqrt[b]*c^3) + (e*Sqrt[P
i/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*Sq
rt[b]*c^3) + (d*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sq
rt[b]]*Sin[a/b])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(2*Sqrt[b]*c^3)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
```

```
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4635

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*Cos[x], x], x, ArcSin[c*x]], x]
/; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rubi steps

$$\int \frac{d+ex^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx = \int \left(\frac{d}{\sqrt{a+b\sin^{-1}(cx)}} + \frac{ex^2}{\sqrt{a+b\sin^{-1}(cx)}}\right)dx$$

$$= d\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx + e\int \frac{x^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

$$= \frac{d\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{e\,\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{e\,\text{Subst}\left(\int \left(\frac{\cos(x)}{4\sqrt{a+bx}} - \frac{\cos(3x)}{4\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{c^3} + \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}\right.}{bc}$$

$$= \frac{e\,\text{Subst}\left(\int \frac{\cos(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{4c^3} - \frac{e\,\text{Subst}\left(\int \frac{\cos(3x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{4c^3} + \frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\right.}{}$$

$$= \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} + \frac{d\sqrt{2\pi}S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} + \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\right.}{}$$

$$= \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} + \frac{d\sqrt{2\pi}S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} + \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\right.}{}$$

$$= \frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3} + \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} - \frac{e\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)C\left(\sqrt{\frac{6}{\pi}}\right.}{2\sqrt{b}c^3}$$

Mathematica [C] time = 0.60476, size = 246, normalized size = 0.75

$$-\frac{ie^{-\frac{3ia}{b}}\left(3e^{\frac{2ia}{b}}\left(4c^2d+e\right)\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-3e^{\frac{4ia}{b}}\left(4c^2d+e\right)\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},\frac{i(a+b\right.}{}\right.}{24c^3\sqrt{a+b\,s}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((-I/24)*(3*(4*c^2*d + e)*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b
]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] - 3*(4*c^2*d + e)*E^(((4*I)*a)/b
)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] - S
qrt[3]*e*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcS
in[c*x]))/b] - E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (
(3*I)*(a + b*ArcSin[c*x]))/b])))/(c^3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c*x
]])
```

Maple [A] time = 0.068, size = 248, normalized size = 0.8

$$\frac{\sqrt{2}\sqrt{\pi}}{12\,c^3}\sqrt{b^{-1}}\left(12\,\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{b^{-1}}b}\right)c^2d+12\,\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{b^{-1}}b}\right)c^2d-\sqrt{3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] 1/12/c^3*(1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(12*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2
)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^2*d+12*cos(a/b)*FresnelC(2^(1/2)
/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^2*d-3^(1/2)*cos(3*a/b)*F
resnelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e-3
^(1/2)*sin(3*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*arcsin
(c*x))^(1/2)/b)*e+3*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arc
sin(c*x))^(1/2)/b)*e+3*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*
arcsin(c*x))^(1/2)/b)*e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{ex^2 + d}{\sqrt{b \arcsin(cx) + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)/sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{d + ex^2}{\sqrt{a + b \operatorname{asin}(cx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral((d + e*x**2)/sqrt(a + b*asin(c*x)), x)
```

Giac [C] time = 2.56747, size = 655, normalized size = 1.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*s
qrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/sq
rt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*d*erf(1/2*I*sqrt(2)*sqrt(b*a
rcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs
(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) +
 1/4*sqrt(pi)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt
(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b + 1)/((sqrt(6)*sqrt(
b) + I*sqrt(6)*b^(3/2)/abs(b))*c^3) - 1/4*sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(
b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(
abs(b))/b)*e^(I*a/b + 1)/(c^3*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(
b)))) - 1/4*sqrt(pi)*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b))
 - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b + 1)/(c^3*
(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/4*sqrt(pi)*erf(-1/2
*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x)
 + a)*sqrt(b)/abs(b))*e^(-3*I*a/b + 1)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2
)/abs(b))*c^3)
```

3.697 $\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx$

Optimal. Leaf size=101

$$\frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}+\frac{\sqrt{2\pi}\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}$$

```
[Out] (Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(Sqrt[b]*c) + (Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/S
qrt[b]]*Sin[a/b])/(Sqrt[b]*c)
```

Rubi [A] time = 0.0950421, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4623, 3306, 3305, 3351, 3304, 3352}

$$\frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}+\frac{\sqrt{2\pi}\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(Sqrt[b]*c) + (Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/S
qrt[b]]*Sin[a/b])/(Sqrt[b]*c)
```

Rule 4623

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[a/b - x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 n}, x]
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx = \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc}$$

$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc}$$

$$= \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{bc} + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \cdots\right.}{bc}$$

$$= \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{bc}} + \frac{\sqrt{2\pi}S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{bc}}$$

Mathematica [C] time = 0.0964359, size = 121, normalized size = 1.2

$$\frac{ie^{-\frac{ia}{b}}\left(e^{\frac{2ia}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)-\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)\right)}{2c\sqrt{a+b\sin^{-1}(cx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((I/2)*(-(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin
[c*x]))/b]) + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I
*(a + b*ArcSin[c*x]))/b]))/(c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0., size = 83, normalized size = 0.8

$$\frac{\sqrt{2}\sqrt{\pi}}{c}\sqrt{b^{-1}}\left(\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}}{\sqrt{\pi}b}\sqrt{a+b\arcsin(cx)}\frac{1}{\sqrt{b^{-1}}}\right)+\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}}{\sqrt{\pi}b}\sqrt{a+b\arcsin(cx)}\frac{1}{\sqrt{b^{-1}}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] 2^(1/2)*Pi^(1/2)*(1/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b)+sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)
```

```
*(a+b*arcsin(c*x))^(1/2)/b))/c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b \arcsin(cx) + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + b \operatorname{asin}(cx)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*asin(c*x)), x)
```

Giac [C] time = 1.79073, size = 215, normalized size = 2.13

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{c\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}-\frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{c\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqr
t(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/sqrt
(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*erf(1/2*I*sqrt(2)*sqrt(b*arcsi
n(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))
/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))))
```

3.698 $\int \frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi [A] time = 0.0567442, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}}\,dx = \int \frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

Mathematica [A] time = 0.145486, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]),x]
```

```
[Out] Integrate[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]), x]
```

Maple [A] time = 0.209, size = 0, normalized size = 0.

$$\int \frac{1}{ex^2+d}\frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\operatorname{asin}(cx)}\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*asin(c*x))*(d + e*x**2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)\sqrt{b\arcsin(cx)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*sqrt(b*arcsin(c*x) + a)), x)
```

3.699 $\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi [A] time = 0.0537331, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}}\,dx = \int \frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}}\,dx$$

Mathematica [A] time = 0.279222, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]),x]
```

```
[Out] Integrate[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]), x]
```

Maple [A] time = 0.478, size = 0, normalized size = 0.

$$\int \frac{1}{(ex^2+d)^2} \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2 \sqrt{b \arcsin\left(cx\right)+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)^2*sqrt(b*arcsin(c*x) + a)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.700 $\int \frac{d+ex^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=394

$$\frac{\sqrt{\frac{\pi}{2}}\,e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{\sqrt{\frac{3\pi}{2}}\,e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{\sqrt{\frac{\pi}{2}}\,e\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right.}{b^{3/2}c^3}$$

```
[Out] (-2*d*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*e*x^2*Sqrt[1 -
c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (2*d*Sqrt[2*P
i]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2
)*c) + (e*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) + (e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c^3) + (2*d*Sqrt[2*Pi]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) -
(e*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Si
n[(3*a)/b])/(b^(3/2)*c^3)
```

Rubi [A] time = 0.797611, antiderivative size = 394, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.45, Rules used = {4667, 4621, 4723, 3306, 3305, 3351, 3304, 3352, 4631}

$$\frac{\sqrt{\frac{\pi}{2}}\,e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{\sqrt{\frac{3\pi}{2}}\,e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{\sqrt{\frac{\pi}{2}}\,e\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right.}{b^{3/2}c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*e*x^2*Sqrt[1 -
c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (2*d*Sqrt[2*P
i]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2
)*c) + (e*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) + (e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c^3) + (2*d*Sqrt[2*Pi]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) -
(e*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Si
n[(3*a)/b])/(b^(3/2)*c^3)
```

Rule 4667

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4621

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + Dist[c/(b*(n + 1)),
```

```
 Int[(x*(a + b*ArcSin[c*x])^(n + 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4631

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[(
x^m*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] - Dist
[1/(b*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[(a + b*x)^(n + 1), Sin
[x]^(m - 1)*(m - (m + 1)*Sin[x]^2), x], x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{d+ex^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = \int \left(\frac{d}{\left(a+b\sin^{-1}(cx)\right)^{3/2}} + \frac{ex^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\right) dx$$

$$= d\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx + e\int \frac{x^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2cd)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b} + \frac{(2e)\,\mathrm{Subst}\,(\int$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d)\,\mathrm{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc} - e\,\mathrm{Sub}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right.}{bc}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(4d\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\,\mathrm{s}}\right.}{b^2c}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} - \frac{2d\sqrt{2\pi}\,\mathrm{co}}{}$$

Mathematica [C] time = 1.17343, size = 417, normalized size = 1.06

$$\frac{e^{-\frac{3i\left(a+b\sin^{-1}(cx)\right)}{b}}\left(\left(4c^2d+e\right)e^{\frac{2ia}{b}+3i\sin^{-1}(cx)}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\,\mathrm{Gamma}\left(\frac{1}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+\left(4c^2d+e\right)e^{\frac{4ia}{b}+3i\sin^{-1}(cx)}\sqrt{\frac{i(a+b\sin}{b}}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (e*E^(((3*I)*a)/b) - 4*c^2*d*E^(((3*I)*a)/b + (2*I)*ArcSin[c*x]) - e*E^(((3
*I)*a)/b + (2*I)*ArcSin[c*x]) - 4*c^2*d*E^(((3*I)*a)/b + (4*I)*ArcSin[c*x])
 - e*E^(((3*I)*a)/b + (4*I)*ArcSin[c*x]) + e*E^(((3*I)*(a + 2*b*ArcSin[c*x]
))/b) + (4*c^2*d + e)*E^(((2*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b
*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + (4*c^2*d + e)*
E^(((4*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1
/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*e*E^((3*I)*ArcSin[c*x])*Sqrt[((-I)
*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[
3]*e*E^((3*I)*((2*a)/b + ArcSin[c*x]))*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b])/(4*b*c^3*E^(((3*I)*(a + b*ArcSin[c*x
]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0.113, size = 446, normalized size = 1.1

$$\frac{1}{2\,bc^3}\left(-4\sqrt{\pi}\sqrt{a+b\arcsin(cx)}\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{b^{-1}}b}\right)\sqrt{2}\sqrt{b^{-1}}c^2d+4\sqrt{\pi}\sqrt{a+b\arcsin(cx)}\sin\left(\frac{a}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] 1/2/c^3/b*(-4*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi
^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*(1/b)^(1/2)*c^2*d+4*P
i^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1/b)^(1
/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*(1/b)^(1/2)*c^2*d+Pi^(1/2)*(a+b*arcs
in(c*x))^(1/2)*cos(3*a/b)*FresnelS(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+
b*arcsin(c*x))^(1/2)/b)*2^(1/2)*(1/b)^(1/2)*3^(1/2)*e-Pi^(1/2)*(a+b*arcsin(
c*x))^(1/2)*sin(3*a/b)*FresnelC(2^(1/2)/Pi^(1/2)*3^(1/2)/(1/b)^(1/2)*(a+b*a
rcsin(c*x))^(1/2)/b)*2^(1/2)*(1/b)^(1/2)*3^(1/2)*e-Pi^(1/2)*(a+b*arcsin(c*x
))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(
1/2)/b)*2^(1/2)*(1/b)^(1/2)*e+Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*Fre
snelC(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*(1/b)
^(1/2)*e-4*cos((a+b*arcsin(c*x))/b-a/b)*c^2*d+cos(3*(a+b*arcsin(c*x))/b-3*a
/b)*e-cos((a+b*arcsin(c*x))/b-a/b)*e)/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{ex^2 + d}{(b \arcsin(cx) + a)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x^2 + d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{d + ex^2}{(a + b \operatorname{asin}(cx))^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((d + e*x**2)/(a + b*asin(c*x))**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{ex^2 + d}{(b \arcsin (cx) + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)/(b*arcsin(c*x) + a)^(3/2), x)
```

3.701 $\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=137

$$\frac{2\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}$$

```
[Out] (-2*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*Sqrt[2*Pi]*Cos[a/
b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c) + (2
*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b]
)/(b^(3/2)*c)
```

Rubi [A] time = 0.268031, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4621, 4723, 3306, 3305, 3351, 3304, 3352}

$$\frac{2\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^(-3/2),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*Sqrt[2*Pi]*Cos[a/
b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c) + (2
*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b]
)/(b^(3/2)*c)
```

Rule 4621

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^(n + 1))/(b*c*(n + 1)), x] + Dist[c/(b*(n + 1)),
 Int[(x*(a + b*ArcSin[c*x])^(n + 1))/Sqrt[1 - c^2*x^2], x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[d^p/c^(m + 1), Subst[Int[(a + b*x)^n*Sin[x]^m*C
os[x]^(2*p + 1), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] &&
 EqQ[c^2*d + e, 0] && IntegerQ[2*p] && GtQ[p, -1] && IGtQ[m, 0] && (Integer
Q[p] || GtQ[d, 0])
```

Rule 3306

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[(c*f)/d + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rubi steps

$$\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{(2c)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{2\,\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc}+\frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\right.}{}$$

$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{\left(4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{b^2c}+\frac{\left(4\sin\left(\frac{a}{b}\right)\right)}{}$$

$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}+\frac{2\sqrt{2\pi}C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)\sin\left(\right.}{b^{3/2}c}$$

Mathematica [C] time = 0.308078, size = 167, normalized size = 1.22

$$\frac{e^{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\left(e^{i\sin^{-1}(cx)}\sqrt{-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)+e^{\frac{ia}{b}}\left(e^{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\sqrt{\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}}\text{Gamma}\left(\frac{1}{2},\frac{i(a+b}{}\right.\right.\right.}{bc\sqrt{a+b\sin^{-1}(cx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^(-3/2),x]
```

```
[Out] (E^(I*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a +
 b*ArcSin[c*x]))/b] + E^((I*a)/b)*(-1 - E^((2*I)*ArcSin[c*x]) + E^((I*(a +
```

```
b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*Arc
Sin[c*x]))/b]))/(b*c*E^((I*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] time = 0., size = 149, normalized size = 1.1

$$-2\frac{1}{cb\sqrt{a+b\arcsin(cx)}}\left(\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin(cx)}\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{b^{-1}}\sqrt{\pi}b}\right)-\sqrt{b^{-1}}\sqrt{\pi}\sqrt{2}\sqrt{a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] -2/c/b*((1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*Fresn
elS(2^(1/2)/Pi^(1/2)/(1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-(1/b)^(1/2)*Pi^
(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(1
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+cos((a+b*arcsin(c*x))/b-a/b))/(a+b*arc
sin(c*x))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(-3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(a+b\operatorname{asin}(cx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**(-3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(-3/2), x)
```

3.702 $\int \frac{1}{(d+ex^2)(a+b\sin^{-1}(cx))^{3/2}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^{3/2}},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi [A] time = 0.0639963, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx=\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Mathematica [A] time = 0.159029, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A] time = 0.201, size = 0, normalized size = 0.

$$\int \frac{1}{ex^2+d}\left(a+b\arcsin(cx)\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^(3/2)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a+b\operatorname{asin}(cx))^{\frac{3}{2}}\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**(3/2)*(d + e*x**2)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^(3/2)), x)
```

3.703 $\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi [A] time = 0.0604461, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx=\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Mathematica [A] time = 0.294822, size = 0, normalized size = 0.

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A] time = 0.503, size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2}\left(a+b\arcsin(cx)\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2 (b \arcsin (cx) + a)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)^(3/2)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
```

```
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
```

```
AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
    debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
    ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
```

```
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do not as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
```

```
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
      1
    else
      max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
        1
      else
        max(2,ExpnType(op(1,expn)))
      end if
    else
        max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
```

```
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]

def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
```

```
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn
    )))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
    ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or
    type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
    expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType
    ,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
```

```
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

def tree(expr):
    debug=False;
    if debug:
         print ("Enter tree(expr), expr=",expr)
         print ("expr.operator()=",expr.operator())
         print ("expr.operands()=",expr.operands())
         print ("map(tree, expr.operands()=",map(tree, expr.operands()))

    if expr.operator() is None:
        return expr
    else:
        return [expr.operator()]+list(map(tree, expr.operands()))

def leaf_count(anti):
    debug=False;

    if debug: print ("Enter leaf_count, anti=", anti, " len(anti)=", len(anti))

    if len(anti) == 0: #special check for optimal being 0 for some test cases.
       if debug: print ("len(anti) == 0")
       return 1
    else:
        if debug: print ("round(1.35*len(flatten(tree(anti))))=",round(1.35*len(flatten(tree(anti)))))
        return round(1.35*len(flatten(tree(anti)))) #fudge factor
                         #since this estimate of leaf count is bit lower than
```

```
                     #what it should be compared to Mathematica's

def is_sqrt(expr):
    debug=False;
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug = False

    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug = False

    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
    sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','
    hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in
    sagemath

```

```
def is_atom(expn):

    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):
    debug=False

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
```

```
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): # is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):
    debug = False;

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, " leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=", expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```